THE ROLE OF CLASSIFICATION

in the

MODERN AMERICAN LIBRARY

Allerton Park Institute

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Number Six

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Papers Presented at an Institute
conducted by
The University of Illinois Graduate School of Library Science
November 1-4, 1959

Foreword

The autumn institutes on professional librarianship, which are sponsored jointly by the University of Illinois Graduate School of Library Science and the University Extension Division, are held at Robert Allerton Park, a University-owned country estate near Monticello, Illinois, each year. This volume contains the papers presented at the sixth of these institutes, held November 1-4, 1959. The series was inaugurated in 1954 with an Institute on School Library Administration. In 1955, the subject of the institute was Developing the Library's Personnel Program; in 1956 The Nature and Development of the Library Collection was discussed; in 1957 the topic was The Library as a Community Information Center; in 1958 attention was focused on Library Service to Young Adults. The 1959 Institute was devoted to the Role of Classification in the Modern American Library.

In planning for an informal meeting of a small group it is sometimes more satisfactory if speakers will point their papers toward representatives of a certain kind of library, or a certain size of library, or towards service to a special group of library users. There seemed to be no way to mark off one group of classifiers from another; the interest in classification can exist in a librarian from any size or type of library. It was decided that this institute would be addressed to those librarians who have a deep interest in the whole field of classification and the program was planned to present a broad picture of classification today. That this is an interesting subject can be adduced from the registrants who came from many kinds of libraries—small public, large public, college and university, research, special libraries, and school libraries—to hear about and discuss the state of classification today. The majority of the registrants came from Illinois and nearby states, but there were others from distant points and more would have come if the accommodations at Allerton Park had been greater.

Planning the Institute was the work of a committee of the faculty of the Graduate School of Library Science, composed of Frances B. Jenkins, Donald E. Strout, and Thelma Eaton, chairman. Harold Lancour, who is an *ex officio* member of all institute committees was not in residence at the time of the meeting but he did take part in the planning during its early stages. Other members of the faculty who were present for as many meetings as their classes permitted helped in many ways to make the meeting go smoothly. Special thanks are due to Jo Ann Wiles, Library Science Librarian, for assembling the collection of classification schemes, and to Dewey Carroll for assuming the responsibility for that exhibit at Allerton House and taking over

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any other small chores that needed doing. As always special thanks
are due to the staff of the Extension Division and Allerton House for
their cooperation and the many services most graciously rendered.
And finally our sincere thanks to the speakers, who took time from
their own busy schedules to come and share their knowledge and ideas
with us, and to the registrants who by their interest made the institute
a living thing.

THELMA EATON
DONALD E. STROUT
Editors

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The Administrator Looks
at Classification

Robert B. Downs
*Director, Graduate School of Library Science
University of Illinois*

A strong case can be made out, I am convinced, for the proposition
that many librarians are obsessed with classification for the sake of
classification. With rare exceptions, investigation has revealed, li-
brary users are totally indifferent to classification, so long as it does
not actually interfere with their finding the books they want. If they
have thought about the matter at all and were given a choice, the
readers would vote for the utmost possible simplicity in whatever
scheme of classification is adopted. Logical sequences, a fetish wor-
shipped by numerous classifiers, mean little to all except an occasion-
al professor of philosophy.

Though I would not argue for it, there is a good deal to be said for
the accession order in arranging the books in a library—simply num-
bering the first book received 1, the second 2, and so on *ad infinitum*,
filling every shelf to capacity, and saving much space. Such a plan
appears to have worked satisfactorily in the half-million volume li-
brary of the London School of Economics, but that is a closed shelf
collection and perhaps belongs to a special category.

Carrying the thesis further, I would maintain that librarians,
principally in colleges and universities, have been guilty of wasting
millions of dollars in elaborate and unnecessary reclassification pro-
grams, using funds that could have been spent to far greater advantage
to everyone concerned in building up their book resources. To be
specific, consider the cases of two of the most poverty-stricken uni-
versity libraries in the country: The University of Mississippi and
the University of South Carolina, both of which have expended tens of
thousands of dollars in recent years, changing over from one standard
system of classification to another. Meanwhile their book budgets
were at about the level of a college library without any university pre-
tensions. Here is almost incontrovertible support for such critics as
Lawrence C. Powell, when they charge that librarians are more con-
cerned with housekeeping than with books and reading.

What exactly does the library patron—scholar, research worker,
student, or general reader—have a right to expect of library classifica-
tion? One thing he should *not* expect, because it is a practical impos-
sibility, is to find *all* the materials on any given subject grouped to-
gether. This was, of course, convincingly demonstrated by the Kelley

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studies.[1] A characteristic of the literature of virtually every modern field is that it cuts across subject lines. There are no longer any watertight compartments—if there ever were. The physicist, to illustrate, is interested not only in the strictly physical literature, but in biology, chemistry, engineering, mathematics, and other related areas. The lawyer is concerned not simply with legal treatises, but with psychology, medicine, political sciences, economics, sociology, and nearly everything else under the sun. Every classifier is familiar with innumerable cases of border-line books—books that could just as logically be placed in one classification division as another, or perhaps several others, with the final decision usually resting upon the interests of the particular institution.

No less responsible for the scattering of materials on a specific topic is format. Even if it were possible to group together all the separately-printed monographic titles, vast quantities of references on most subjects must remain scattered in periodicals and other serial publications, government documents, newspapers, collections of essays, reference works, and bibliographical compilations.

We can only conclude, therefore, that the most perfect system of classification ever devised by man, or likely to be invented, can be but partially successful in any aim to bring together all related materials on whatever subject. It follows logically, therefore, that the users of libraries must anticipate supplementing the undoubted values of classification with catalogs, periodical indexes, documents indexes, essay indexes, printed bibliographies, and similar tools. The deficiencies of classification can be partially offset by expert cataloging, with which classification must always remain interdependent, but even the combination does not provide a complete answer. Eventually, perhaps, some form of automation, indexing every idea dealt with in the library's collections, may furnish an adequate solution.

When people enter a library to find a book, I suggest that they will ordinarily use one of three approaches. If there is a specific title in mind, it will be located through author or title in the catalog. This approach is characteristic of the scholar who, in most instances, will know or is presumed to know exactly what he wants. The only significance of classification for him is as a finding device. The student and general reader, on the other hand, are often uncertain about their requirements, except that they are interested in a subject. They may attempt to solve their problem by going direct to the shelves (assuming there is an open stack system), or through inspection of subject entries in the card catalog. Of these two approaches, the catalog is almost invariably more reliable and more complete, though that method lacks the psychological satisfaction of seeing and handling the books themselves.

Whether the library collection is to be arranged for the convenience of the specialist or for the generalist, simplicity of classification is to be preferred. Here is another spot where the librarian is frequently tempted by art for art's sake, stringing out the classification symbols,

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whether letters or numbers, to interminable lengths. It may be mistaken judgement to fix an arbitrary limitation, but it seems to me difficult to justify a subject classification of more than six characters for any book, and if author and title symbols are added, these too should not be allowed to exceed a half-dozen. Anything beyond that number complicates location and shelving problems, and increases the labor and expense of classification.

But, assert perfectionists among the classifiers, scientific and exact classification often requires carrying numbers out to eight, ten, or even more places. This, to me, is comparable to the value of pi in mathematics. No matter how far it is extended, it is still imperfect, and for ordinary purposes I am willing to settle for 3.14 instead of 3.14159265 or pi extended to infinity.

As an old New York Public Library alumnus, I recall how simple, yet generally efficient, is the scheme developed over sixty years ago by Dr. John Shaw Billings for that great research institution. Here, in one of the world's largest libraries, three letters are usually sufficient to classify any book in the collection. The principle of the classification is so clear that a new stack attendant can readily grasp it in a few minutes' time. Cutter numbers and minute subdivisions do not clutter up or confuse finding a book on the shelf. This also is a closed-stack system, though that fact I think does not destroy the validity of my argument. Given the class number, any intelligent person can quickly locate a specific title.

When life can thus be so uncomplicated, why should college libraries of less than 100,000 volumes adopt, as dozens of them have done, anything so detailed and complex as the Library of Congress classification? Some are apparently under the delusion that they will eventually reach the size of Harvard or the British Museum, and consequently they must be ready for the future. Meanwhile, as the price of preparing for that unlikely contingency, their students and faculty for generations to come must struggle with a system too involved for them to understand or appreciate, a scheme they have not met in high school and will probably not find in any public library they may use later, and which puts unnecessary obstacles in their way in using the college library.

It is not proposed here to weigh the respective advantages and disadvantages of the Library of Congress and Dewey Decimal classifications. That has been done *ad nauseam* and by experts. According to Eaton's investigations[2], less than two per cent of the academic libraries in the United States use anything other than one of these two schemes, and the percentage is at least as high for public libraries. As a practical matter, it would be difficult to justify adoption of any classification other than Dewey or L. C. in an American library, except perhaps for an occasional highly specialized collection. These two are the only schemes for which any provision has been made to keep updated, and both possess the important advantage of having their classification numbers printed on Library of Congress cards. Despite their

acknowledged defects, the Dewey and L. C. have proven themselves in the fire of several generations' experience.

From the point of view of an administrator, the chief question in my mind is this one: Having adopted one scheme, either L. C. or Dewey, for a library, is it wise to change? Assuming classification has been in the hands of competent personnel, and has been applied as efficiently and expertly as human frailties permit, can the librarian make a reasonable case for reclassification? My candid opinion is that he cannot.

According to Maurice Tauber, who has studied the matter more exhaustively than anyone else, to my knowledge:

Most of the reasons for reclassification have been based on either or both of two assumptions: (1) That the use of the new classification achieves a grouping of the books in the collection that is of greater educational significance and shows to the users the currently accepted relationships among the branches of knowledge more effectively than did the system being replaced, and (2) That the adoption of a new classification will reduce the costs of technical processes.[3]

Tauber believes that there has been considerable rationalization among librarians who have attempted to justify reclassification. There is little concrete evidence that the hoped-for benefits actually materialize. We do know, however, that the cost involved in complete or extensive reclassification runs into large sums of money, that it frequently extends over decades of time, and may seriously interfere with the use of the library while the work is in progress. Another consideration brought out by Tauber in a further study is whether an inferior classification system and catalog appreciably handicap library users. His findings cast substantial doubt on the matter, from which he concludes:

The burden of proof rests upon the librarian to show that the outmoded classification and the antiquated catalog interfere with the use of library materials or increase the cost of preparing them for use. It is not possible to answer definitively the question of whether a particular library should reclassify or recatalog. If its present status is such as to interfere greatly with the proper functioning of the library in its service to scholarship, then a change is indicated; otherwise, changes should be made with considerable caution. Only as greatly improved service can be seen to result from reorganization may the tremendous costs involved be justified.[4]

A case study of the difficulties of reclassification was described by Harriet MacPherson.[5] The project was to transfer about 4,000 volumes from the 650 class in Dewey to a special classification developed

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for the Columbia University School of Business Library. This would seem a rather small operation. Yet the reclassification involved the removal, frequent remaking, and the refiling of 4,000 shelf list cards, and the actual handling of all the volumes. The last step meant verification of the books with the cards, frequent recataloging of the books, fitting the books into the new classification scheme, and labeling the volumes with new numbers. The entire process required the services of two people for more than two years. Their work was continually hampered and retarded by delays in locating the books, caused by such factors as many books being charged out to readers, some volumes being on reserve in departmental libraries, professors on sabbatical leave having carried off a few volumes, some books being in the bindery, and others having been lost. Here in microcosm are the problems confronting a large library in even more aggravated form when it decides to reclassify.

The question of whether a library afflicted with an obsolete and wholly inadequate classification should reclassify poses quite a different problem from the decision to change from, say, Dewey to L. C. or from L. C. to Dewey. About a dozen years ago, I was a member of a survey team for the Cornell University Library. We were called upon to advise on the retention or abandonment of a homemade plan, the Harris classification, adopted in 1891. Some 800,000 volumes at Cornell had been arranged by this curious scheme, based on the old British Museum system of press numbers, a fixed location device. The surveyors agreed that there was no alternative to discontinuing this outdated, inflexible, and inconsistent arrangement, which had for all practical purposes broken down, and replacing it with the Library of Congress classification. Under such conditions, there was no question that reclassification was essential, even though it involved the Library in estimated expenditures of $600,000, and fifteen to twenty years of disruption.

Undoubtedly, more studies are needed of the way people actually use library catalogs and classification, as a basis for administrative decisions. We then might be able to operate more on fact than on theory. Paul Dunkin, who, as Head Cataloger at the Folger Shakespeare Library for a number of years, had an excellent vantage point from which to view scholars at work, offered some observations on how, specifically, an Elizabethan scholar proceeds with his researches. Such a scholar, reports Dunkin:

> works with Elizabethan handwriting (palaeography), Francis Bacon (philosophy and law), Elizabeth and Essex (history and biography), 'rogues and vagabonds' (sociology and economics), and Thomas Cartwright (religion), as well as with the plays of Shakespeare (literature).[6]

Comparing their basically different approaches to classification, Dunkin pointed out that, ''The librarian's classification is, so to speak,

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vertical; the scholar's, horizontal." Perhaps the twain are destined never to meet.

In the Classics Library at the University of Illinois is a prime example of the scholar's horizontal classification, achieved mainly by ignoring the librarian's classification. Discarding the literature classification in Dewey for the Classics, all Latin authors are arranged in one large alphabetical group under a single class number, and similarly all Greek authors are in a straight alphabetical sequence under another number. There have been assembled here philosophy, church fathers, economics, the languages, the arts, the literatures, antiquities, history and biography, without any effort to subdivide by specific topics. The basic concept is to bring together books according to their use. This scheme, which was devised fifty years ago, for a library of 35,000 volumes, is apparently exactly what the scholar wants, and generations of them have expressed their satisfaction with it. The essential idea has been incorporated into the L. C. classification's treatment of the classical literatures.

As a general rule, however, tinkering with a classification arrangement creates more problems than it solves. If one has adopted the Library of Congress or Dewey scheme, it is best to adhere to it and not attempt to introduce innovations to meet what may be regarded as special situations. As a keen critic of classification, Berwick Sayers, remarked, "Librarians are seldom able to leave their classification alone." Mr. Sayers added that "the moving about of classes to suit the convenience of the furniture arrangements, the adjustments made with biography, fiction, other literature, and in music, occur to one as often causing difficulties . . . . changes are often unskillfully made and the advantages they give are not always so great as their authors imagine."[7]   It is the adoption of special, homemade schemes of classification and radical modifications of standard classification schedules that have more frequently brought about the need for reclassification than has dissatisfaction with an established plan. The amateur usually fails to realize the complexities of classification, when he starts changing it.

In trying to represent the point of view of the administrator in this paper, my aim has been to consider those aspects of classification that involve administrative problems and relationships. Chief among these are costs, efficiency, the convenience of the reading public, and the relation of classification to the library service as a whole. Those are considerations that concern every professional-minded librarian, and not merely administrators.

Classification means different things to different people.   Robert Graves in his book *5 Pens in Hand* relates what he calls his favorite story about nomenclature:

An old lady was taking a pet tortoise by train in a basket from London to Edinburgh, and wanted to know whether she ought to buy a dog-ticket for it, as one has to do in England if one takes a

cat by train—because cats officially count as dogs. "No," said the ticket inspector, "No mum! Cats is dogs, and rabbits is dogs, and dogs is dogs, and squirrels in cages is parrots, but this 'ere turkle is a hinsect. We won't charge you nothing, mum!"[8]

Notes

1. Grace O. Kelley, *The Classification of Books, an Inquiry into its Usefulness to the Reader* (New York: H.W. Wilson Co., 1937)

2. Thelma Eaton, *Classification in Theory and Practice, a Collection of Papers* (Champaign, Ill.: Illini Union Bookstore, 1957), pp. 29-42, 45-58.

3. Maurice F. Tauber, "Subject Cataloging and Classification Approach the Crossroad," *College and Research Libraries,* III (March, 1942), 153-54.

4. Maurice F. Tauber, "Reclassification and Recataloging in College and University Libraries, Reasons and Evaluation," *Library Quarterly,* XII (October, 1942), 845.

5. Harriet D. MacPherson, "Reclassification of College and University Libraries," *College and Research Libraries,* I (March, 1940) 160.

6. Paul S. Dunkin, "Classification and the Scholar," *College and Research Libraries,* III (September, 1942), 336.

7. W.C. Berwick Sayers, "Failures of Classification Considered," *Library World,* XLIV (March, 1942), 129.

8. Robert Graves, *5 Pens in Hand* (New York: Doubleday, 1958) pp. 333-34.

The Development of
Classification in America

Thelma Eaton
Professor of Library Science,
University of Illinois

The story of the development of classification from Aristotle to Ranganathan has been told so often that, as I worked on this paper, I found myself wondering what I could possibly contribute to the subject. In our planning sessions the committee had agreed that it was desirable to provide some kind of a summary of classification practices before we attempted to analyze the conditions which exist today and to divine what the future holds. Even so, as I stand before you this morning, I find myself wondering if we might not have done better to omit the history and begin with the stimulating and provocative talk which will follow this introductory speech. But to fulfill our program I shall talk briefly on the development of book classification in American libraries. In theory I should cover the period from colonial times to the present, and I shall touch on some of the earlier attempts at classification, but my emphasis will fall on the last half of the nineteenth century, that period in American library history when many things were happening.

The complete history of classification in American libraries remains to be written and our sources for even a summary of such a history are all too few. There are some catalogues of colonial libraries, but these are seldom arranged by subjects. Of the twenty catalogues which have survived, all but three are arranged alphabetically, either in a single list, or divided into three or four such lists by size. As modern librarians we immediately concede the efficiency of shelving folios, quartos, octavos, duodecimos, and smaller in separate places but there is no evidence that books were shelved according to size. It is assumed that the usual arrangement on shelves was a fixed location. Probably a rough subject grouping was followed when a collection was first arranged; with the addition of new titles, or the movement of the library from one room to another, the subject order was disturbed. Of the three surviving catalogues of the earliest period, the Yale catalogue of 1743, the 1760 catalogue of James Logan's library, and the partly classed 1764 catalogue of the Redwood Library, only the Loganian catalogue reflected shelf arrangement. Thomas Jefferson's books were placed on the shelves in the library at Monticello in an order that matched the grouping of books in his catalogue. However, the practice of Thomas Jefferson was not commonly followed

and as late as 1893 fixed location was a common arrangement of books, although catalogues might be classified.

When librarians developed subject arrangements for books they frequently borrowed ideas from the classifications of knowledge prepared by philosophers and scholars of the past. All of us heard, early in our courses in library school, that Dewey's classification scheme was based on that of Francis Bacon,[1] and it has been pointed out that Bacon's scheme was basically that of Aristotle.[2] Obviously then, to study book classification one must begin with Aristotle and study the various outlines of knowledge and the practical applications of these outlines to the arrangement of books. During the years from Aristotle to the period of colonial America hundreds of outlines were made, but we will mention only two in addition to Bacon. Aristotle himself divided knowledge into three parts: practical or ethical; productive or creative; and theoretical. Under practical he included the subjects of economics, politics, and law. His productive or creative area included poetry and the arts. His theoretical included mathematics, physics, and theology.

Following Aristotle there were many philosophers who attempted to equate the outline of knowledge with the various disciplines of education. In Roman civilization the seven liberal arts were the preparatory disciplines and the higher studies were theology, metaphysics, and ethics. The seven liberal arts were divided into the trivium, consisting of grammar, dialectics, and rhetoric, and the quadrivium, consisting of arithmetic, music, geometry, and astronomy. Varro, who lived from 116-27? B.C. made a classification of knowledge which was merely a listing of the seven liberal arts with medicine and architecture added. The writings of philosophers from Varro through the middle ages frequently contained classifications of knowledge which were nothing but this outline of studies, with higher studies of medicine, jurisprudence, and theology added as they found their place in the curricula of the universities.

The sixteenth century classification which Conrad Gesner used in his *Pandectarum sive Partitionum Universalum,* the classified arrangement of his *Bibliotheca Universalis,*[3] was an expansion of the schemes which represented the outlines of studies. An examination of the twenty-one headings which Gesner used shows the familiar pattern of trivium and quadrivium plus higher studies and some rather miscellaneous subjects. Gesner used the term Philosophy for the universe of knowledge and thought of it as containing preparatory studies and substantial studies. The preparatory studies were divided into necessary and embellishing. The necessary included the seven liberal arts, here expanded to nine by the addition of poetry to the trivium, or conversational arts, and the use of both astronomy and astrology in the quadrivium, or mathematical arts. These were the necessary preparatory courses for advanced work. His embellishing courses have puzzled classifiers by their variety: divination, geography, history, and useful arts. His substantial sciences, or higher studies (natural

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philosophy, metaphysics, moral philosophy, domestic philosophy, civil arts, law, medicine, and Christian philosophy) are virtually the same as the subjects which Aristotle listed as theoretical. Thus Gesner combined the outline of Aristotle with the program of studies of the university of his day and included other areas discussed in the books that he examined for his universal bibliography.

This brings us to Francis Bacon who settled himself down in 1603 to lament the sad state into which learning had fallen in his time. He divided knowledge into divine and human and in setting forth what men should learn he outlined knowledge as he saw it, relating it to the three parts of man's understanding: his memory, his imagination, and his reason. Memory covered history, including natural, civil, ecclesiastical, and literary history. Imagination, represented by poesy, contained lyric, epic, and dramatic poetry, and fables. Reason was concerned with philosophy which included science, mathematics, theology, anthropology, physiology, psychology, and sociology. The development of philosophical classifications did not end with Francis Bacon, but his was the last such scheme to have a noticeable effect on nineteenth century book classification.

The other scheme which exerted influence on book classification in the United States during the early period was a practical scheme used by Paris booksellers to arrange titles in their sale catalogues. That this scheme was also influenced by Bacon's outline of knowledge is clearly evident to anyone who places the two outlines together. In its final form the bookseller's scheme became the model for numerous classification schemes used in American libraries. Presumably based on the work of Jean Garnier, a Jesuit, who prepared a catalogue of Clermont College in Paris in 1678,[4] or that of Ismael Bouillaud, who compiled a catalogue of the library of Jacques-Auguste de Thou in 1679,[5] and altered by Gabriel Martin,[6] and Guillaume de Bure,[7] it was best known in the form used by Jacques-Charles Brunet, in his *Manuel du Libairie et de l'Amateur de Livres*.[8] The scheme contains five main classes: theology, jurisprudence, science and arts, literature, and history. With very little adjustment these five main classes can be fitted into the inverted Baconian scheme used by later classifiers. Certainly Brunet's scheme owes much to Bacon's outline of knowledge but because it was specifically adapted to the needs of a book classification, it is customary to think of Bacon as a philosophical scheme and Brunet as a practical one.

This then was the state of classification when America was settled. What was known in Europe found its way to America in due course. Books containing the outlines of philosophic classifications and catalogues of books for sale showing various ways of arranging subjects would have been available to colonial librarians. It is possible that the outlines used in the three surviving catalogues are based on outlines used elsewhere. It has been suggested that the classification used in the 1743 catalogue of Yale College, prepared by the Rector, Thomas Clap, was copied from an outline of knowledge presented by

Samuel Johnson, President of Kings' College, in an essay published in 1731,[9] but Rector Clap implied that the outline was his own when he wrote:

> I have here with considerable Labour and Pains prepared a *Calalogue* of the Books in the Library under proper Heads so that you may readily find any Book, upon any particular subject.[10]

Clap's classes represented subject areas and there was little attempt to make a systematic arrangement of the subjects although geography, history, and biography did fall in successive classes.[11]

The 1760 catalogue of James Logan's library[12] was divided into twelve classes[13] with each class subdivided by size. Within the size groups the arrangement was alphabetical. No systematic order is evident in the arrangement of classes.

The 1764 catalogue of the Redwood Library[14] was in two parts. The books purchased with Redwood's gift of money were arranged by size. The subject arrangement of the folios, quartos, and duodecimos was roughly alphabetical by author. However the octavos were divided into eight classes,[15] which in turn seemed to fall into sub-classes, although no headings were used to mark these divisions. There were little groups of titles on such subjects as painting, military science, carpentry, agriculture, sports, and electricity under the class Arts, Liberal and Mechanic. The only reason for dividing the octavos into classes that has been suggested is the number of entries.[16] They fill approximately twelve of the twenty-two pages required for listing the Redwood gifts. The books "given by other gentlemen" were listed in four groups: folios, quartos, octavos, etc., and pamphlets.

The story of classification must always be told in terms of the men who produced the schemes and in discussing the development of classification in America we shall be concerned with librarians and other scholars who were interested in achieving an orderly arrangement, either systematic or practical, for the books in libraries. We shall find some men dedicated to a single scheme, as Jefferson was dedicated to the Baconian outline of knowledge. We shall find others, like Jacob Schwartz, who could produce a number of quite different schemes. Jefferson's first scheme was used in a catalogue of 1783; Schwarts proposed his fifth scheme in 1893. This period of something more than one hundred years is our immediate concern. The scores of schemes that were produced during this period reflected the changing patterns of knowledge and provided the foundation for the orderly arrangement of books. In the early years the outstanding men of the profession turned their talents to classification, but in our day, the last twenty or thirty years, classification has been looked on as a necessary evil and the talented members of the profession have often concentrated on other aspects of librarianship.

The first classifier of note in the post-Revolutionary period was

Thomas Jefferson, third president of the United States, who shelved
the books in his library according to a Baconian order and provided
a catalogue in that order. Jefferson's book collecting activities had
begun when he was a young man. His first library, destroyed by fire
in 1770, was valued by the owner at £ 200.[17] Following the fire he
renewed his bookcollecting activities and by 1783 had assembled 2640
books which were arranged in his library according to a classification
scheme based on "An Outline of Human Knowledge" found in *L'Ency-
clopédie ou Dictionnaire Raisonné des Sciences, des Arts et des
Métiers*. Diderot and D'Alembert had altered the Baconian classes of
History, Poesy, and Philosophy to read History, Philosophy, and Im-
agination and had expanded Bacon's outline. Jefferson's scheme fol-
lowed the French version closely but he called his main divisions
History, Philosophy, and Fine Arts.[18] Jefferson explained to his friend
James Ogilvie[19] that books were arranged on the shelves divided into
twelve subjects[20] with the arrangement beginning "behind the partition
door leading out of the Bookroom into the Cabinet" and proceeding
from left to right. The catalogue follows this same order but is ex-
panded to forty-six chapters. The arrangement of the catalogue which
Jefferson provided to accompany his library after its purchase for the
Library of Congress differed only slightly from this classification of
1783; there was some reorganization in Fine Arts and the total number
of chapters was reduced from forty-six to forty-four. After the sale
of his books to the government, Jefferson, inveterate collector that he
was, began assembling another library. However, his third classifica-
tion scheme is found not in the catalogue of his third library but in an
acquisition list for the Library of the University of Virginia. Jeffer-
son prepared this catalogue of items to be purchased for the Univer-
sity in September 1824, arranging the titles in a classed order following
his usual Baconian form. The scheme was virtually the same as that
employed in his two earlier catalogues. More space was given to law,
and subjects which had had separate chapters in the 1815 classification
were combined. Of the influence of Jefferson's scheme on other li-
braries we have little evidence, but the 1815 catalogue of the Library
of Congress[22] was printed in an edition of 600 copies and these must
have been rather widely distributed. Moreover, the Jefferson classi-
fication remained in use at the Library of Congress until 1898.

The early Harvard catalogues, beginning in 1723, were arranged in
alphabetical order within size groups. From press marks which are
included in the first volume it appears that the books were originally
grouped on shelves in a rough subject order but we have no record of
a classification as such. However, the 1830 catalogue provided a sys-
tematic index which was designed to serve the purpose of a classed
catalog. This 1830 catalogue was prepared by the librarian Benjamin
Pierce.[23] It was a three volume work, containing the alphabetic file
under authors in two volumes and a systematic index in volume III.
The arrangement was that of Brunet,[24] with a sixth class for works
relating to America. The purpose of this class is not clear since

section IX of the class V, History, was assigned to American History. There was some duplication of entries in the two places but not everything in Works Relating to America appeared in section IX of class V.

Another librarian as devoted to the Baconian outline as Jefferson was Edward William Johnston, who became the librarian of the College of South Carolina in 1835 and a year later produced a classified catalogue which was strongly reminiscent of the Diderot-D'Alembert adaptation of Bacon used by Jefferson. Johnston went from South Carolina to the New York Mercantile Library Association and produced for that library a catalogue which used virtually the same classification as that adopted for his earlier catalogue.

In 1858 Johnston became librarian of the St. Louis Mercantile Library Association. This library, which had been founded in 1845, had published its first catalogue, prepared by William P. Curtis, in 1850. The arrangement under six headings was clearly the Harvard arrangement of Brunet.[25] The compiler of the catalogue thus identified the scheme:

> With respect to the arrangement of the Classification, it may be well to state, that it is the same, with little exception, as that which is used in the Catalogue of the Harvard University Library of 1830; and, as to a subject upon which the rules are so arbitrary, and opinions so various, it is believed that this arrangement is as perfect as any heretofore published, and it is hoped that it will be as satisfactory to the mass of our readers as any which could be adopted.[26]

But the French scheme did not long survive the arrival of Johnston. Johnston was too ardent a Baconian to accept it and shortly after his arrival in 1858 embarked upon a new catalogue. It was a classified catalogue because he was convinced that no other kind of catalogue was satisfactory. In the introduction to the catalogue he said:

> There is but one real method of arranging the contents of large libraries; and this is the Systematic—the regular classing of books, each under the subject which it treats, so as to bring together in one body all that the collection affords as to each separate matter; while every matter, of course, finds its own due place in a right intellectual arrangement of all human knowledge. A mere alphabetical method (if indeed it can be called such) can never, no matter how well executed, supply the place of a true one. There is nothing to recommend it except the facility of execution. For to make its (so-called) Classified Index at all accomplish what it assumes to do, it would have to be as large and minute as a regular systematic one, while totally destitute of its advantage of rational arrangement.[27]

The scheme, as usual in his catalogues, was a modification of Bacon,

following the Diderot-D'Alembert version. A third catalogue of the library produced in 1874[28] was also Baconian but showed slight changes from the earlier works. The Baconian scheme was retained until about 1892 when Horace Kephart began reclassification to the sixth expansion of Cutter.

The influence of the Harvard version of the Brunet classification is reflected in the first catalogue of the San Francisco Mercantile Library. The catalogue, prepared by Horace Davis in 1854, was quite similar to the catalogue which was prepared for the St. Louis Mercantile Association Library in 1850. The 1861 catalogue[29] of the San Francisco Mercantile Library made some changes but the Brunet scheme was still clearly evident.[30] This remained the scheme in use until about 1891 when the library was reclassified using the Decimal Classification of Dewey.

The scheme[31] used for arranging the Boston Public Library, although not important in itself, is mentioned for two reasons. It is often referred to as an early decimal scheme and it was prepared not by a librarian, but by a member of the library board of trustees. The scheme, which was decimal only in the method of placing books in a room which extended three floors in height and had ten alcoves of ten ranges each, with ten shelves to a range, on each floor, was a fixed location arrangement. Alcoves were assigned to the various subjects and ranges were assigned to the subdivisions. The call number showed alcove number, range number, shelf number, and number of the work, not the volume, on a shelf. This ingenious scheme was devised by Nathaniel Shurtleff, but the details of putting it into operation were carried out by C.C. Jewett. It may have had some vogue in Massachusetts libraries. The public library of Haverhill, Massachusetts, reported in 1893 that the scheme had been in use there for ten years. At the same time the public library of Cambridge, Massachusetts, reported the use of the Cutter classification, with Shurtleff notation, and gave the time it had been in use as eighteen years.

Jacob Schwartz, librarian of the Apprentices' Library in New York, was one of the most versatile of classification makers and one of the most ardent and vocal speakers on the subject of classification at meetings of librarians. Schwartz was concerned with the practical arrangement of books on shelves. He established his divisions into classes on the basis of the number of books in each division rather than on the importance of the division as a field of knowledge. His notation was designed to arrange books by subject, by size, and alphabetically by author. The three main classes (Cosmology, or Natural Science; Anthropology, or Human Science; and Theology, or Divine Science) were divided into twenty-five general classes with nine subclasses for each. He began to apply the system to books purchased for the New York Apprentices Library in 1871, and in 1874 printed a catalogue of the library[32] with a classified index.

In 1879 Mr. Schwartz produced a mnemonic system of classification, consisting of an alphabetico-subject arrangement of classes. In 1882

he presented a second alphabetic scheme which used a quite different set of terms for the classes. Both of these schemes were accompanied by elaborate author marks that separated books into four sizes ranging from duodecimo to folio, and arranged them alphabetically within the size groups. In 1885 he produced another scheme containing ten main classes. Except for the general works the classes were in alphabetic order. The three digit notation which accompanied this scheme was not decimal in nature. In answer to Kephart's questionnaire of 1893 he produced a variation of this scheme. There were still ten classes but the alphabetic order was abandoned. The last four schemes produced by Schwartz were not applied to the Apprentices' Library, nor is there any record that they were adopted elsewhere but libraries which were developing local schemes may have used some of the ideas found in the many articles which Schwartz wrote for library journals. St. Benedict's College at Atchison, Kansas, used, until 1926, a scheme consisting of forty broad classes, each class divided into five size groups: folio, quarto, octavo, duodecimo, and sextodecimo. Some libraries still use Schwartz book notation.

At about the time that Jacob Schwartz was beginning his work at the Apprentices' Library in New York a scholar and philosopher was turning his attention to classification in the distant city of St. Louis. William Torrey Harris had been born in Connecticut and educated at Andover and Yale. He went to St. Louis in 1858, as a teacher in the public schools. In 1866 he was elected assistant superintendent of schools and two years later he became superintendent of schools. He left St. Louis in 1880 to assist in founding a school of philosophy in Concord, Massachusetts. In 1889 he became United States Commissioner of Education.

As superintendent of schools, Harris was *ex officio* one of the "Managers" of the library. The public library, which was maintained by the school district of St. Louis, was established in 1865. In 1870 Harris published in the *Journal of Speculative Philosophy* a scheme for classing books in libraries. [33] In the same year the scheme was applied to the St. Louis Public Library.

In explanation of the scheme Harris wrote:

It uses Bacon's fundamental distinction (developed in the *De Augmentis Scientarium,* Book II, chap. I) of the different faculties of the soul into MEMORY, IMAGINATION, and REASON, from which proceed the three great departments of human learning, to wit: History, Poetry, and Philosophy. Without particularly intending to classify books as such Lord Bacon attempted to map out "Human learning" as he called it, and show its unity and the principle of development in the same. But his deep glance seized the formative idea which distinguished different species of books. [34]

Harris made no claim of originality in using Bacon's outline. He

had examined other Baconian schemes and had developed an organization somewhat different from theirs. He acknowledged his indebtedness to Johnston in the following words:

I should not omit this opportunity to refer to the Catalogue of that excellent collection, the St. Louis Mercantile Library, which is based on the Baconian system. In fact, it was the eminent, practical success of that system of classification—considering both its usefulness to the reader and the convenience to the librarians —that led to this attempt at a Classified Catalogue of the Public School Library. This form of the Baconian system adopted in the Catalogue of the Mercantile Library is substantially that of *D'Alembert* (*Encyclopédie Methodique* 1787); but it has numerous modifications introduced by the fertile mind of the librarian, Edward Wm. Johnston, Esq . . . .

Many of the subdivisions in the present Catalogue have been borrowed from this system, but his [Johnston's] system lacks proper subordination, and there is consequently much confusion in the second department, or "Philosophy."[35]

There has been considerable discussion of the influence of the Harris scheme but there is little that can be proved. The Peoria [Illinois] Mercantile Library soon adopted the scheme as the best that was available at that time. As the Board of Directors explained:

To arrange such a system of classification, however, one that shall be complete and exhaustive, is an effort of the highest philosophy, for it implies no less than a classification of all "human learning as preserved in books," a classification of the working, developments and productivity of the mind of man, nay, of the mind of the Creator Himself, so far as that mind is revealed to us through the phenomena of the universe. To this great task the loftiest intellects have at time applied themselves, and still left the work imperfect. In Edwards' *Memoirs of Libraries* are cited thirty-two celebrated schemes of classification, and among them those of Bacon, Bentham, Coleridge, Ampere, Leibnitz, D'Alembert, and Schleiermacker.

It is needless to say the plain business men, who compose the present Board of Directors of the Mercantile Library, would not presume to improve on what these philosophers have left imperfect. They were compelled to choose from among such schemes as lay before them, and after much comparison of the various systems, including those now in use in the Boston Public Library, the Public Library and Mercantile Library of Cincinnati, the Mercantile Library of St. Louis and others, have adopted, without hesitation, as being the most complete and

exhaustive of any that have fallen under their observations, the Baconian System as elaborated by Mr. Wm. T. Harris of St. Louis.[36]

The scheme was further expanded for use of the Peoria Library in a second catalogue, published in 1899.[37] The librarian remarked at that time that the scheme "continues to give excellent satisfaction as a working system."[38] This catalogue shows variations from the scheme as used in St. Louis.

Melvil Dewey's classification came into existence three years after Harris published his scheme in the *Journal of Speculative Philosophy*. Like Harris, Dewey made no pretense of having produced an original scheme. He said that he had been influenced by the reading he had done and the schemes he had examined. He noted that he had received many ideas from the scheme of Natale Battezati which was used by the Italian publishers in 1871. He specifically denied the use of the Harris scheme as a model.

The plan of the St. Louis Public School Library and that of the Apprentices Library of New York, which in some respects resemble his own, were not seen till all the essential features were decided upon, though not given to the public.[39]

Certainly the order of subdivisions follows the Harris order, as Harris followed Johnston in many cases. That it was Dewey's scheme, rather than Harris' which became established in American libraries may be attributed both to the more easily remembered notation of the Decimal Classification and to the fact that Dewey was an active librarian who appeared at library meetings and talked much about the advantages of his scheme. The scheme of Dewey, the practical librarian, was accepted; that of Harris, the philosopher, is mentioned today only in library school courses in classification.

When Charles Ammi Cutter became librarian of the Boston Athenaeum that library used fixed location for shelf arrangement. Cutter did not attempt to change this until he had completed a dictionary catalogue. He had intended to use Dewey's classification as printed but upon examination he decided to modify it by adopting a larger base using the letters of the alphabet to designate classes, and by establishing a system of book numbers based on author entry. He worked out a local list for designating places that was later adopted for use in connection with other classification schemes. He was convinced that this and his other mnemonic devices were superior to Dewey as is shown in one of his letters to Katharine Sharp:

I am not satisfied with one sentence [of your letter].—"It lacks mnemonic features which are a help to some people." I should have said that the E.C. has ten times as many mnemonic features as the D.C., it has a good deal of alliterative mnemonics,

all of which the D.C. hasn't because it does not employ letters.
The local list is a good mnemonic assistant.[40]

The scheme was designed as a practical means for shelving books,
but a logical outline of knowledge was not ignored. In describing his
classification Cutter said that he had tried:

> . . . to provide a classification at once logical and practical;
> it is not intended for a classification of knowledge, but of books.
> I believe however, that the maker of a scheme for book arrange-
> ment is most likely to produce a work of permanent value if he
> keeps always before his mind a classification of knowledge.[41]

The *Expansive Classification* consisted of seven classification
schemes, the first designed for a library of 100 volumes, the seventh
sufficiently minute to accomodate a library of ten million volumes.
The scheme can be said to date from 1879 since the first accounts of
it appeared at that time. The fifth expansion was published in 1882
and the sixth was completed between 1891 and 1893. The work on the
seventh expansion had not been completed at the time of Cutter's
death in 1903 and no complete index for the seventh expansion was
prepared.

The *Expansive Classification* ranked next to the *Decimal Classifi-
cation* in acceptance by libraries but it is impossible to estimate the
number of libraries that adopted the scheme. We have five sources
which give us some information: the Kephart report presented at
the 1893 meeting of the American Library Association;[42] the figures
assembled by the A.L.A. survey of 1920-22;[43] a general statement in
a biography of C.A. Cutter which was published in 1931;[44] a survey of
college and university libraries made in 1953;[45] and a survey of public
libraries made in 1955.[46]

At the time of the 1893 report, eighteen of the 127 large libraries
(libraries with collections of 25,000 volumes or more) were using
Cutter's classification. Several of the reporting libraries were in
the process of adopting the sixth classification which had just been
completed. Others reported that they had adopted the scheme as
planned for the Boston Athenaeum and had been using it for a number
of years. Only one library expressed dissatisfaction with the scheme;
the Peabody (Massachusetts) Institute of Technology would have pre-
ferred a simpler scheme. Unfortunately there is no record of the
number of libraries with less than 25,000 volumes that were using the
Expansive Classification, but some early experimental applications
were made in the public library of Winchester, Massachusetts, and it
is believed that other small libraries in that state adopted the scheme.
The A.L.A. survey of 1920-22 reported that twenty of the 1243 public
and semi-public libraries included in the survey used Cutter's classi-
fication. The same survey stated that only four of the 261 college and
university libraries had adopted this scheme. These figures are

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obviously incomplete since replies to the questionnaire used in the 1953 survey accounted for at least thirteen college and university libraries which were still using *Expansive Classification* as late as 1925.[45] In a biography of his uncle, which W.P. Cutter published in 1931, is a statement that a total of at least one hundred libraries wer using the scheme at the date of writing the biography. The libraries are not listed but we assume that this is an approximately correct figure for the period. Since libraries were unlikely to change from another scheme to Cutter's in the period between 1924 and 1931 it must be assumed that the twenty-four public and academic libraries reported by the A.L.A. survey must represent incomplete returns. The 1953 survey of college and university libraries found the *Expansive Classification* in only four of the 744 libraries reporting. The 1955 survey of public libraries, with collections of 25,000 volumes or more, found Cutter's scheme used, in whole or in part, by fifteen of the 863 libraries. As there was no record for libraries with less than 25,000 volumes in 1893 so there is no record for the smaller public libraries sixty years later.

The use of the *Expansive Classification* was not limited to New England although it was probably used more extensively in Massachu setts than elsewhere. The Library Society of Charleston, South Carolina, and various libraries in Texas used it. It found its way to Montana, and although both the Montana School of Mines and Western Montana College of Education have reclassified, the Helena, Montana Public Library is still a Cutter library unless a change has been mad in the last few years. A number of colleges in Wisconsin used Cut-ter's scheme but most of them reclassified a number of years ago. J.C.M. Hanson introduced Cutter into the University of Wisconsin where it remained until the very recent reclassification project. To-day, so far as I have been able to ascertain, Cutter's *Expansive Classification* can be found in only three colleges: Lake Forest in Illinois, Wesleyan, and Mount Holyoke. It is gradually slipping out of those public libraries, probably less than twenty at this time, which have retained it. If there is a tone of regret in my voice, it is only what you hear in the voices of many classifiers. *Expansive Classifi-cation* was a good classification, a classifier's classification it is tru but easy for patrons to use. It has been called Cutter's best work, but he will probably be known to future generations for his *Rules for the Dictionary Catalogue*[47] and for his *Alfabetic Author Tables*.[48]

Frederick Beecher Perkins was one of the many brilliant men drawn into librarianship in the early years. He was deeply intereste in the profession and articles by him appeared often in library perioc icals. He also took over the task of preparing catalogues for librarie His catalogue of the Fall River, Massachusetts, Public Library is an excellent example of a dictionary catalogue with classified sections.[4] He began work as a school teacher in New York City in 1849, moved on to Newark in 1850, and in 1851 he became assistant in the Boston Public Library. From 1879 to 1887 he was librarian of the San Fran cisco Public Library.

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It was during the time that he served as Librarian of the San Francisco Public Library that his classification scheme was published. The first edition appeared in 1881 and the revision in 1882.[50] He explained the origin of the scheme thus:

> The present classification originated in that drawn up a good many years ago, substantially on the basis of Brunet's or the "Paris system" by Mr. S. Hastings Grant, long the courteous and efficient Librarian of the New York Mercantile Library. The catalogues of that library consisted of two parts—viz., an alphabet by authors' names (and anonymous titles), and the classification under topics. There were thus no title-entries proper at all. This scheme had more merit for practical purposes than has been attributed to it. I revised this work of Mr. Grant's twice over, for successive catalogue issues of that library in 1866, 1869 and 1872, each time enlarging the number of topics or ultimate sections. If I had prepared another catalogue for that library, I meant to make the classification such as I have now made it.[51]

However, a comparison of the Grant and Perkins outlines shows some differences.[52] It is noted that in main classes Perkins' scheme followed Brunet more closely than Grant's did. In his later revision Perkins continued the Brunet form.

In explaining the changes between the revised edition of his scheme and the original edition Perkins said:

> A few sections or topics have been added, some of them from the well-considered classification recently published by Mr. Lloyd P, Smith, Librarian of the Philadelphia Library Company, and some other minor alterations and additions have been made.[53]

The State Library of Iowa adopted Perkins' scheme about 1883, and the State Library of Nebraska was also using it in 1893. San Francisco did not use it but continued to use Dewey although Mr. Perkins said that the more he used Dewey's scheme the less he liked it.[54]

The Library Company of Philadelphia, founded in 1731, had a Baconian catalogue in 1789,[55] but the scheme of the French booksellers was adopted by George Campbell when he prepared the classified catalogue which was published in 1807. The books, however, remained on the shelves in size groups by order of accession. At the 1853 Librarian's Conference, Lloyd P. Smith, at that time librarian of the Library Company of Philadelphia, mentioned the difficulty of locating books arranged in this manner. When the Loganian Library was moved to the Ridgeway Branch in 1878 it was decided to adopt a classified arrangement of books on the shelves. Smith developed a new scheme, still using Brunet as a base. He used the five traditional

classes of Religion, Jurisprudence, Science and Arts, Belles Lettres, and History, and made a sixth class for Bibliography and History of Literature. The scheme was published in 1882 with an alphabetic index which provided notation for "Mr. Dui's system of classification" as well as for Smith's scheme.[56]

Smith was much more flexible in his approach to classification than most makers of classification schemes. Usually the author is anxious that his scheme be not tampered with in any way, but Smith stated that while he thought of his six main classes and their subclasses as permanent, he felt that the subdivisions could be adjusted as a librarian wished. He further suggested that anyone who wanted to expand his scheme could do so by consulting Brunet for examples. It may well be that the scheme was adopted more widely than our present records show. Its simplicity (except in notation of sub-divisions) and the possibility of adapting to local needs might have appealed to librarians who heard it discussed at library meetings. Central College in Fayette, Missouri, used it and the Kansas State Library, at Topeka, was using it, with additions, in 1893.

John Edmands, librarian of the Mercantile Library of Philadelphia, was rescued from virtual oblivion by Verner Clapp's article, "A.L.A. Member Number 13: A First Glance at John Edmands."[57] Edmands served as assistant librarian to the Brothers of Unity Society at Yale in 1845. After graduation he taught school for a year and then returned to the Yale Divinity School. After that graduation he became assistant in the Yale College library and helped develop a classification scheme for use there. In April of 1856 Edmands accepted a temporary appointment to prepare a supplement to the catalogue of the Mercantile Library of Philadelphia. The librarian resigned shortly after he arrived and Edmands was appointed to his position. He retired in 1901 at the age of 80, but remained as librarian emeritus until his death in 1915.

Edmands found a classified catalogue, arranged under thirty-four main headings, which was unsatisfactory to him; he proceeded to develop a new scheme.[58] His aim was to arrange books on the shelves so that they could be found without using a catalogue. He reduced the classes to twenty-three; twenty-two of them designated by letters of the alphabet, omitting I, Q, U, and Z. Prose fiction, the twenty-third class, was left without a notational symbol. An examination of the scheme shows nine of the twenty-three classes devoted to history, and three to literature. Edmands also developed an author notation using figures from 1 to 9,999. No author initial was required with this scheme. A similar scheme is found today in Benyon's Law schedule.[59] H. J. Carr, librarian of the Cedar Rapids, Iowa, Public Library, seems to have adopted the Edmands scheme in 1884. Minneapolis adopted it about 1889 under Herbert Putnam. Certain changes were made in Minneapolis both in the order of classes and in the author numbers.[60] Biography and music still follow the Edmands scheme in the Minneapolis library, according to information provided on a questionnaire.

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William Frederick Poole, one of the contributors to the 1876 report on *Public Libraries in the United States,* was actively engaged in library work from his undergraduate college days until his death. At Yale he was the assistant to John Edmands in the Brothers of Unity Library. In 1851 he became an assistant in the Boston Athenaeum, and eleven months later became the librarian of the Boston Mercantile Library Association. In 1856, when the librarian of the Boston Athenaeum retired, he was appointed to the position but he resigned suddenly in 1869 and for a period of two years was a consultant in the organization of libraries. He became librarian of the new Cincinnati Public Library in 1871 after serving as consultant for the library. In 1873 he became the first librarian of the new Chicago Public Library, and in 1887 accepted the task of organizing a new reference library being formed in Chicago. He remained at the Newberry Library until his death in 1894.

Poole emphasized the dictionary catalogue as a means of finding material in the library and used a rather loose shelf arrangement for books. He has been credited with originating the dictionary catalogue which was later developed by Cutter,

> . . . . the modern dictionary catalogue—combining authors and subjects in one alphabet—which it is to the credit of Mr. Poole to have invented, and of Messers. Cutter, Noyes, and others to have developed.[61]

But if Poole has been deprived of honor due him for the dictionary catalogue, perhaps it can be balanced by the undeserved credit, which properly belongs to Edmands, given him for originating the index to periodical articles.[62] His shelf arrangement was a practical means of assembling books. Letters which were assigned to the classes stood for cases, and a block of numbers, thought to be sufficient for probable titles in that class, was assigned to the letters. If an unexpected number of books was added a new block of numbers was begun.

This very flexible scheme was applied to the Enoch Pratt Free Library, the Chicago Public Library, and the Newberry Library. The scheme used in the Indianapolis Public Library was basically the same scheme although there were more classes and fewer numbers assigned to individual classes. Omaha used the same scheme as Indianapolis. Since these schemes were developed by individual libraries, within the framework set up by Poole, they are often thought of as local schemes.

Josephus Larned, who is known to all librarians as an historian, is one of several librarians who used the *Decimal Classification* of Melvil Dewey but developed a scheme of his own which presumably pleased him better. Larned had been a bookkeeper and a newspaper reporter before he was elected superintendent of public instruction in Buffalo, New York, in 1871. In 1877 he was appointed superintendent of the Buffalo Young Men's Christian Association Library with the

understanding that he was to reorganize the collection. The books were not classified and after studying various available schemes he selected *Decimal Classification* for his use. It has been claimed that this was the first library to adopt the *Decimal Classification*. Larned's own scheme was developed in 1884. It was an interesting scheme, consisting of a series of tables which could be coupled together to represent more minute divisions of subjects.[63]

The classification which J.C. Rowell developed for use in the University of California Library in 1892 was based on the curriculum of the University and was prepared with the cooperation of certain members of the faculty.[64] The arrangement of mathematics, for example, was a slightly modified version of one prepared by Professor Irving Stringman. Rowell wanted the shortest possible notation and in order to decide how much space he would need for each class he counted the books in various classes. He used A for Bibliography, B for Encyclopedias, and C for Periodicals and built his series of subject areas on a base of 999. The outline resembled Dewey, with certain variations, but there were no mnenomic features and the notation was brief, although lower case letters were added to mark divisions.

Mr. Rowell did not know whether any libraries had adopted his scheme. He replied to Miss Sharp's question in 1896 by saying:

No attempt to introduce the classification into other libraries has been made; and I can not tell if it has been adopted elsewhere, although from the very frequent calls for it, I believe it has been, at least in modified form. Mr. Fletcher of Amherst has thought very kindly of it, and perhaps knows of particular libraries using it. You might inquire also of the University of Minnesota Library.[65]

The only record of use of the scheme that has come to my attention was at Haverford College, Pennsylvania, where it was used until reclassification in 1923.

William I. Fletcher, librarian of Amherst had published the first draft of a proposed classification scheme in the *Library Journal* as early as 1889. He stated that his scheme was designed:

To offer a way of escape for those who shrink from the intricacies and difficulties of elaborate systems, and to substitute for painstaking analytical classification a simple arrangement that is better adapted to be practically useful in a library while doing away with most of the work involved in carrying out one of those schemes.[66]

A revised version of the scheme was included in his *Public Libraries in America*[67] in 1894, and it was issued separately with alterations, additions and index later the same year.[68] In the letter which he sent

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to Miss Sharp in response to her request for copies and in answer to her question about adoption of the scheme by libraries he could only say:

I am sorry that I cannot refer you to any library using my classification. I have paid no attention whatever to the question of its use in any place and do not suppose it has been adopted in many.[69]

This superficial summary shows us that the 19th century was a period of intense interest in classification. The leaders in the library world were concerned with this aspect of librarianship. The majority of these men were well known as librarians, scholars, historians, authors, etc.; almost all of them appear in the *Dictionary of American Biography*. Seth Hastings Grant and Lloyd P. Smith were active at the 1853 conference of librarians. Dewey, Cutter, Edmands, Poole, Smith, and Larned were charter members of the American Library Association. Poole, Cutter, Dewey, Fletcher, and Larned were presidents of A.L.A. In that period men of stature were interested in classification and individual schemes were the rule. So long as books remained on the shelves in fixed location, new schemes could be adopted for the printed catalogues. This allowed a degree of experimentation that is impossible in today's large libraries, which shelve their books in relative location.
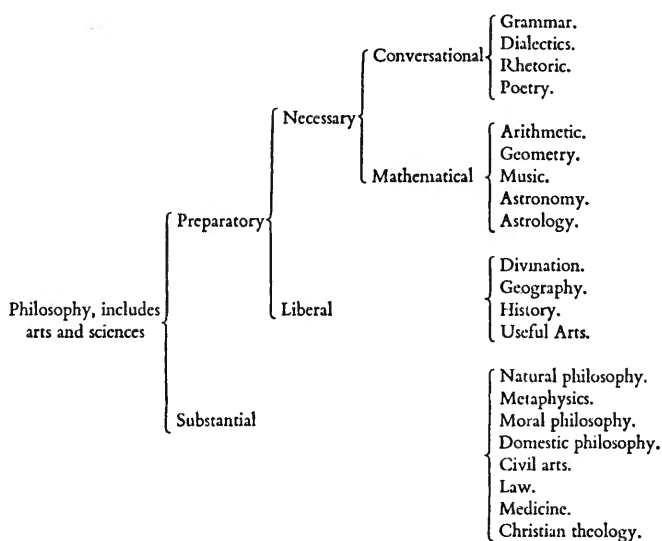
When Kephart sent out his questionnaire to the larger libraries in 1893,[70] he asked what classification scheme was used by the library. He listed the schemes of Cutter, Dewey, Edmands, Fletcher, Harvard, Larned, Perkins, Schwartz, and Smith, but learned later that the Harvard system had not been printed in full and that the Larned classification had not been completed. Of the 127 libraries which replied, eight were using Cutter, thirty-seven were using Dewey, two reported Edmands, two Perkins, one Schwartz, two Smith. No libraries indicated the use of Fletcher, Harvard, or Larned, but two reported the use of Shurtleff, five Poole,[71] and two Harris. Sixty-one of the 127 large libraries chose one of nine different published classification schemes; sixty-six libraries were using local schemes, or a system of fixed location. There are no records available for the libraries with less than 25,000 volumes.

Sixty years later when I attempted to secure information used in about 2,000 libraries, including all college and university libraries and all public libraries with collections of 25,000 volumes or more, I found a very different picture. Instead of nine classification schemes there were two major ones; local scheme were rare. Of the public libraries answering the questionnaire 93% used the *Decimal Classification*. Of the college and university libraries, 84.6% used *Decimal Classification* and 13.8% used Library of Congress *Classification*. A survey taken today would alter the percentages slightly; one by one the Cutter libraries convert to one of the two common schemes; a

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certain amount of changing from D.C. to L.C. continues in the college and university field. With the passing of the 19th century the interest in classification appeared to wane. The printed book catalogue, arranged in classed order, was being replaced by the dictionary card catalogue. Classification was retained for shelving books, but shelf order did not require minute subdivisions. The day of a classification developed for an individual library was passing; the age of conformity was dawning.

Notes

1. Francis Bacon, *The Advancement of Learning* (London: Dent, 1915)

2. B.C. Vickery, *Classification and Indexing in Science* (London: Butterworth, Scientific Publication, 1958), p. 119.

3. System of Conrad Gesner, 1548

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                                                              ┌ Grammar.
                                              ┌ Conversational┤ Dialectics.
                                              │               │ Rhetoric.
                                              │               └ Poetry.
                                  ┌ Necessary ┤
                                  │           │               ┌ Arithmetic.
                                  │           │               │ Geometry.
                                  │           └ Mathematical ─┤ Music.
                                  │                           │ Astronomy.
                   ┌ Preparatory ┤                            └ Astrology.
                   │             │                            ┌ Divination.
                   │             │                            │ Geography.
Philosophy, includes┤            └ Liberal                    ┤ History.
  arts and sciences │                                         └ Useful Arts.
                   │                                          ┌ Natural philosophy.
                   │                                          │ Metaphysics.
                   └ Substantial                              │ Moral philosophy.
                                                              ┤ Domestic philosophy.
                                                              │ Civil arts.
                                                              │ Law.
                                                              │ Medicine.
                                                              └ Christian theology.
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4. Jean Garnier, *Systema Bibliothecae Collegii Parisiensis Societatis Jesu* (Paris: 1678)

5. Ismael Bouillaud, *Catalogus Bibliothecae Thuanae* (Paris: 1679)

6. Gabriel Martin, *Bibliotheca Bultelliana* (Paris: 1711)

7. Guillaume de Bure, *Catalogue des Livres de la Bibliothèque de feu M. le Duc de la Vallière* (Paris: 1783)

8. Jacques-Charles Brunet, *Manuel du Librairie et de l'Amateur de Livres* (Paris: Didot, 1810)

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9. Leo R. La Montagne, "Historical Background of Classification," *The Subject Analysis of Library Materials,* ed. M.F. Tauber (New York: Columbia University School of Library Science, 1953) p. 17

10. *Catalog of the Library of Yale College in New Haven* (New London: Printed by T. Green, 1743) p. A2. Quoted in Joe Kraus. "The Book Collections of American College Libraries," (unpublished Ph.D. dissertation, Graduate School of Library Science, University of Illinois, 1959.)

11. The classes as shown in the above source are:

Languages
Logic, Rhetoric, Oratory, Poetry
Mathematics
Natural Philosophy
Ancient, Natural, and Moral Philosophy
Anatomy, Physicks, Chirugery
Pneumatology and Metaphysics
Geography, Voyages, and Travels
History, Antiquities
Lives of Famous Men
Ethics
Divinity
Law
Miscellaneous Essays
Political Essays
Plays and Books of Diversion

12. *Catalogus Bibliothecae Loganiae:* Being a Choice Collection of Books as well in the Oriental, Greek and Latin as in English, Italian, Spanish, French, and other Languages. Given by the late James Logan, Esq., of Philadelphia, for the use of the Publick, Numbered as they now stand in the Library Built by him in Sixth Street over against the State-House Square (Philadelphia: Printed by Peter Miller & Comp., 1760)

13. The classes as shown by headings were:

Divinity and Ecclesiastical History
History, Antiquities, Geography, Chronology, etc.
Voyages and Travels
Philology
Orators, Poets, Fables, Romances, etc.
Philosophy
Physick, Mathematicks, and Natural History
Arts, Liberal and Mechanical, Magick, etc.
Medicine, Surgery and Chymistry'
Philosophical History
Law
Miscellaneous

14. Elnathan Hammond (comp.), *A Catalogue of Books Belonging to the Company of the Redwood Library, in Newport, on Rhode-Island* (Newport: Printed by S. Hall, 1764.)

15. The classes used for octavos were:

> Classicks
> History
> Divinity and Morality
> Natural History, Mathematics, etc.
> Arts, Liberal and Mechanic
> Miscellanies, Politics, etc.

16. James Ranz. (Ph.D. dissertation in progress. Graduate School of Library Science, University of Illinois)

17. Letter from Thomas Jefferson, Charlottesville to John Page, Charlottesville, Feb. 21, 1770, *The Writings of Thomas Jefferson* (Washington: Issued under the auspices of the Jefferson Memorial Association, 1903) v. 5, p. 18.

18. Dumas Malone, *Jefferson, the Virginian.* (Boston: Little, Brown & Co., 1948) v. 1, p. 401.

19. Letter from Thomas Jefferson, to James Ogilvie, Jan. 1806. Quoted in La Montagne, *op. cit.,* p. 19.

20. *Ibid.* "1. Antient history. 2. Modern. 3. Physics. 4. Nat. Hist. proper. 5. Technical arts. 6. Ethics. 7. Jurisprudence. 8. Mathematics. 9. Gardening, architecture, sculpture, music, poetry. 10. Oratory 11. Criticism. 12. Polygraphical."

21. J.A. Service, *Thomas Jefferson and His Bibliographic Classification* (Chicago: University of Chicago, 1950) Microfilm. p. 70.

22. *Catalogue of the Library of the United States* (Washington: Printed by Jonathan Elliot, 1815)

23. Benjamin Pierce (comp.), *A Catalogue of Harvard University in Cambridge, Massachusetts.* (Cambridge: E.W. Metcalf and Co., 1830-31)

24. The main classes were:

Class I	Theology
Class II	Jurisprudence, Government, and Politics
Class III	Sciences and Arts
Class IV	Belles Lettres
Class V	History
Class VI	Works Relating to America

25. *Catalogue of Books Belonging to the Saint-Louis Mercantile Library Association* (St. Louis: The Association, January 1950) pp. 226-229.

26. *Ibid.* p. v.

27. Edward Wm. Johnson (comp.), *Catalogue, Systematic and Analytical of the Books of the Saint Louis Mercantile Association,* Prepared for the Board of Directors (St. Louis: Printed for the Association, 1858) p. viii.

28. *Classified Catalogue of the Saint Louis Mercantile Library,* with index of authors (St. Louis: The Association, 1874)

29. *A Classified Catalogue of the Mercantile Library of San Francisco:* with an Index of Authors and Subjects; Consisting of About Fourteen Thousand Volumes. Made by the Librarian. January, 1861 (San Francisco: Published by the Association, 1861)

30. The main classes were:

Class I	Novels
Class II	Religion
Class III	Jurisprudence & Government
Class IV	Philosophy, Science & the Arts
Class V	Voyages, Travels, and Personal Adventures
Class VI	History
Class VII	Miscellaneous
Class VIII	Polygraphy

31. N.B. Shurtleff, *A Decimal System for the Arrangement and Administration of Libraries* (Boston: Privately printed, 1856)

32. Jacob Schwartz (comp.), *Catalogue of the Apprentices' Library* Established and Supported by the General Society of Mechanics and Tradesmen of the City of New York (New York: Chatterton and Parker, Printers, 1874)

33. William Torrey Harris, "Book Classification." *Journal of Speculative Philosophy,* IV (April, 1870), pp. 114-129.

34. William Torrey Harris, "Essay on the System of Classification." *Catalogue, Classified, and Alphabetical, of the Books of the St. Louis Public Library* (St. Louis: Missouri Democrat Book and Job Printing House, 1870) p. xi.

35. Ibid. p. xiii

36. *Catalogue of the Peoria Mercantile Library, Alphabetical and Classified* (Peoria: Published by the Library Association, 1872) p. xi.

37. *Peoria Public Library Classified Catalogue* (Peoria: Edward Hine & Co., Printers, 1899.)

38. *Ibid.* p. i.

39. *A Classification and Subject Index for Cataloging and Arranging the Books and Pamphlets of a Library* (Amherst, Mass.: Printed by Carr, Lockwood & Brainard Co., 1870) p. 10.

40. Letter to Katharine Sharp from C.A. Cutter. Stamped date of receipt, Nov. 14, 1898. (Original letter uncatalogued in University of Illinois Library)

41. Charles Ammi Cutter, "The Expansive Classification", *Transactions and Proceedings of the Second International Library Congress,* held in London, July 13-16, 1897 (London: 1898) p. 87.

42. Horace Kephart, "Classification," *Papers Prepared for the World's Library Congress,* held at the Columbian Exposition, ed. Melvil Dewey (Washington: Government Printing Office, 1896)

43. American Library Association, *A Survey of Libraries in the United States* (Chicago: A.L.A., 1924-27) Vol. IV, p. 7.

44. William Parker Cutter, *Charles Ammi Cutter* (Chicago: American Library Association, 1931) p. 44.

45. Thelma Eaton, "Classification in College and University Libraries," *College and Research Libraries,* XVI (April, 1955), pp. 168-176.

46. Thelma Eaton, "The Classification of Books in Public Libraries," *Classification in Theory and Practice* (Champaign, Ill.: Illini Union Bookstore, 1956)

47. Charles Ammi Cutter, *Rules for a Printed Dictionary Catalogue* (Washington: Government Printing Office, 1876). Today's students use the following edition of Cutter's Rules: *Rules for a Dictionary Catalog* (4th ed., rewritten; Washington: Government Printing Office, 1904; Republished by The Library Association, London, 1948)

48. Charles Ammi Cutter, *Two-figure Author Table* (Boston: Library Bureau, 1906)
Charles Ammi Cutter, *Three-figure Alfabetic Order Table* (Boston: Library Bureau, 1902.

49. Frederick B. Perkins and George Rankin (comps.), *Catalogue of the Public Library of the City of Fall River* (Fall River: Press of Fiske & Munroe, 1882)

50. Frederick B. Perkins, *A Rational Classification of Literature for Shelving and Cataloguing Books in a Library.* With alphabetical index. Revised ed. (San Francisco: Francis Valentine & Co., Printers, 1882)

51. *Ibid.* p. iii.

52.

Grant 1850	Perkins 1882
Theology	Religion
Mental and Moral Science	Philosophy
Political Science	Society
History and Geography	History
Mathematics	Biography
Natural Sciences	Science
Medical Science	Literature
Technology	
Encyclopedias	

53. Perkins, *A Rational Classification* . . . . p. iii.

54. *Ibid.* p. iv .

55. *A Catalogue of the Books Belonging to the Library Company of Philadelphia* (Philadelphia: Printed by Zacharia Paulson, jr., 1789).

56. Lloyd P. Smith. *A Plan for the Classification of Books as Well in a Printed Catalogue as on the Shelves of a Library* (Boston: Library Bureau, 1882).

57. Verner W. Clapp. "A.L.A. Member Number 13: A First Glance at John Edmands." *Library Quarterly,* XXVI (January, 1956), p. 1-22.

58. John Edmands. *Explanation of the New System of Classification, Devised for the Mercantile Library of Philadelphia.* (Philadelphia: Mercantile Library of Philadelphia, 1882.)

59. Elizabeth V. Benyon. *Class K. Law* (Washington: Library of Congress, 1948).

60. *System of Classification Index and Scheme for Numbering Books* (Minneapolis: Public Library, 1889).

61. Lloyd P. Smith. "Classification of Books," *Library Journal,* VII (May, 1882), p. 173.

62. Clapp, *op. cit.,* pp. 4-5.

63. J.N. Larned. "A Nomenclature of Classification," *Library Journal,* IX (April, 1884), pp. 62-69.

64. Joseph C. Rowell. *Classification of Books in the Library* (Berkeley, Calif.: University of California, 1894).

65. Letter from J.C. Rowell, Library of the University of California, Berkeley, to Katharine L. Sharp, Director, Department of Library Science, Armour Institute, Chicago. Nov. 16, 1896. (Original letter bound in University of Illinois copy number 1, of title listed in note 64).

66. W.I. Fletcher, *Library Classification* (Boston: Roberts, 1894) p. 3

67. W.I. Fletcher, *Public Libraries in America* (London: Low, 1894).

68. Fletcher, *Library Classification.*

69. Letter, W.I. Fletcher, Amherst College, Massachusetts to Katharine L. Sharp, Director, Dept. of Library Science, Armour Institute, Chicago, Nov. 14, 1896. (Original letter bound in University of Illinois copy of Fletcher, *Library Classification.*).

70. Kephart, *op. cit.,* p. 862.

71. Only three libraries reported the use of Poole's scheme, but Indianapolis, which reported its scheme as movable, broad, later referred to it as Poole's scheme. In reporting to Kephart, Omaha said of its scheme "same as Indianapolis." This accounts for the number of five Poole schemes given in the text.

Classification Today—
Shadow or Substance

Mortimer Taube
President, Documentation, Inc., Washington

The topic which has been assigned to me, "Classification Today—Shadow or Substance," might more appropriately have come at the end of the Institute, rather than the beginning. If I could convince you that our pursuit of valid classifications was the pursuit of a shadow, there would be no reason to listen to the papers on the remaining part of the program. We could all pack up and go home. Hence, I must conclude that when those who planned this Institute gave me this topic, they assumed that regardless of what I might say about classification, I would certainly be unable to demonstrate its ephemeral or shadowy nature and that I would conclude that classification had substantial value for librarianship and related information activities.

Confronted with this dilemma, it occurred to me that the way out for an erstwhile student of logic like myself might be found in the first instance not in examining the nature of shadows nor the nature of substances, but in examining the meaning of the connective between them, namely, the logical operator "or." Most of us, when we think of the word "or," think of it in the exclusive sense as meaning "either or," that is, the word used in this title, "Shadow or Substance," would ordinarily be interpreted to mean that if classification were substantial it could not be shadowy, or if it were shadowy, it could not be substantial. There is, however, another meaning of "or" which is the usual meaning attributed to it in works of logic, where the "or" is taken as meaning logical disjunction with reference to propositions and logical sum with reference to classes. In this sense "or" means "and/or" rather than "either or." Thus if I say "It will rain tomorrow or I will stay home," both statements could be true; that is, it might rain tomorrow and I could still stay home. Similarly, if I say of an item that it is a member of the class A or B, it could be a member of A, a member of B, or a member of AB, and the general proposition "X is a member of A or B" is true in all three cases. This general proposition is only false when the item is a member of neither A nor B. This logical relation can be illustrated by the truth table for disjunction at the top of the following page.

Now then, if we assume that the "or" in the title is the "or" of logical disjunction, then it is possible for me to take the line that classification in some sense is substantial, in some sense is shadowy, and

A	B	A B
T	T	T
F	T	T
T	F	T
F	F	F

in some sense is both. My text, then, becomes one of indicating the sense in which it is substantial and in warning against the sense in which it is shadowy, so that you will be able to judge subsequent papers in this Institute in this context.

We must admit in the beginning that the concern of librarianship with problems of classification represents one of the oldest and strongest links of librarianship with basic intellectual and theoretical questions. As a first year student in library school many years ago, John Lund and I found that questions of classification constituted an intellectual oasis in a barren waste of learning how many spaces should go between the author and title in descriptive cataloguing, or how one collates a book when the publisher has gotten mixed up in his numbering procedure. Hence, the earliest contribution I attempted to make to the art or science of librarianship was a paper on classification. Some of you may have read it. It was called "A Non-Expansive Classification System" and it appeared in the *Library Quarterly*[1] over twenty years ago. In this paper we took the line that a classification system covering all knowledge for all time was certainly chimerical or, as the title assigned to me has it, "shadowy." Hence, we felt that in order to save classification as an intellectual activity for librarianship, it would be necessary to set up our major classes in terms of time divisions; that is to say, the major classes we recommended, instead of being such things as science, literature, art, etc., were historical epochs. We thought it possible that within these historical epochs one might construct adequate classifications; and by this we meant not classifications of knowledge, but classifications of library material itself. One of the major considerations which led us to this conclusion was something we were taught very early in library school. We were taught that the Dewey system was a theoretical system which attempted to legislate for books and that its pigeonholes were created independently of a concern with the content of the pigeonholes. We were taught at the same time that the great advantage of the Library of Congress classification system was that it was made from the books themselves and based upon an empirical study of the material at the Library of Congress. Hence one could say that the pigeonholes or classes in the Library of Congress classification system were actually designed to contain the material in the Library and therefore one could predict an excellent fit. From such an argument, however, it is a simple matter to draw the conclusion that the Library of Congress classification might have fitted the contents of the Library of Congress at the time it was made, but that for future materials to be received by the Library of Congress, the classification system took on the same theoretical and

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predictive character as the Dewey system; that is to say, once the pigeonholes were set up, all new material would have to be fitted into the pre-existing pigeonholes. Hence, with reference to new material, the Library of Congress system differs from the Dewey system only in having different pigeonholes. It was this predictive character that a classification system based on temporal epochs was designed to avoid. We felt that the great virtue of the Library of Congress system, namely, its development from an actual examination of the material to be classified, could always be retained if new classifications were set up as required by the changing pattern of literature.

In the twenty years that have elapsed since this paper, I have seen no reason to weaken its conclusions but I am now convinced that Dr. Lund and I did not go far enough. At that time we did recognize a changing pattern of literature. What we overlooked were the different interests which might exist in the same historical epoch. Now we would say that not only is it necessary to make classifications for different periods of time but that it is necessary to make classifications for different special purposes.

It is not my intention to give you a biographical sketch at this time based upon the various papers that I have written about classification, but Anatole France once described literary criticism as "the adventures of a soul among masterpieces." He meant by this expression that the important thing about literary criticism was not the book criticized, but the nature of the critic. Hence, I feel that I can best carry out my assignment at this Institute by telling you of the various considerations and the steps along the way which have led to my present conclusions about classification in librarianship.

In 1950 I was privileged to give an opening paper at a similar Institute, although the title of the Institute was different. I refer to the Institute on Bibliographical Organization held at the University of Chicago at the Fifteenth Annual Conference of the Graduate Library School. At that Conference I was assigned the topic "The Functional Approach to Bibliographical Organization."[2] In preparing that paper I felt that my first obligation was to define the concept of function, and following suggestions from the biological sciences, I concluded that a function could only be defined in terms of purposes. Hence, a functional approach to bibliographical organization could only mean an analysis of bibliographical organization in terms of its purposes. I concluded, then, that there were no universal purposes and hence that there could not be any universal bibliographical organizations. This indicated that the *Universal Decimal Classification* is certainly "shadowy" since it assumes that the scientific and intellectual enterprises of all men everywhere could be subsumed under a universal purpose. Certainly we can say that an increase of knowledge is the universal purpose of all scientific and intellectual endeavor, but what is required here is not such a general and vague universal purpose but a universal purpose in terms of which we can design and construct an elaborate system of major classes, sub-classes, sub-sub-classes, etc., into

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which we can organize the products of all intellectual endeavor. I did not believe then and I do not believe now that this is even a remotely feasible enterprise. Hence our conclusion at that time was that different individuals or different groups should determine the specific bibliographical organization necessary to their own purposes. I suggested that these special purposes might be related by having each special group make its selection of major class, sub-class, sub-sub-class, etc., from a common vocabulary. Let me say at this time, parenthetically, that at the present time I despair of even such a universal apparatus as a common vocabulary for all sciences.

Aside from my theoretical interest in the problem of classification, I had learned a good deal about its nature and utility from working in libraries, and one of the things I did learn from working in both large and small libraries was that for most such institutions, classification has become a method of shelving books and has ceased to be, if it ever was, a way of organizing the information in such books. This was brought home to me most clearly in my years at the Library of Congress. The Library of Congress, as you know, has closed stacks. The approach to the content of these stacks is through the standard type of dictionary catalogue. Beyond the dictionary catalogue, those who consult its collections use the standard type of printed bibliographies, e.g., *Chemical Abstracts, Physical Abstracts*, the publications of H. W. Wilson and Company, *Public Affairs Information Service*, etc. It therefore seemed that the effort expended in setting up and maintaining an elaborate system of close classification is wasteful, since it has no real impact on the users of the Library. Of course, I knew that there remained within the system of American libraries a number of institutions, such as the Crerar Library and the Engineering Society's Library in New York, which utilize classed catalogues, but it still remains true that in general, classification is not a major tool for the use of contents of libraries. Certainly I was also aware of the very great value of classification as a method of arranging books in open shelf libraries, mainly public libraries or small academic libraries; but I felt in this instance that these classifications had a special purpose, namely, making available to the general reader a rough breakdown of books which reflected a similar rough breakdown of the interests of the general reader, i.e., fiction, travel, science, religion, etc.

I should like at this time to refer to just one other previous paper which we did on this subject. In 1953 we prepared a report for the Office of Naval Research on ''Machines and Classification in the Organization of Information.'' This report was published in Volume II, *Studies in Coordinate Indexing*. In this report I raised the following question: Why, in the face of a general decline in interest of problems of classification in regular library organizations, was there such a renewed interest in the problem among documentation people and people who were concerned with machine searching of information?

How then do we account for the renewed interest in classification as a method of information control? Within the last few years, we have

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witnessed the birth (and in some cases, the rapid death) of dozens of new classification systems, among which we can name, *The Story of Classification for the Army Technical Reference Service;* the Office of Naval Research *Project Status Classification;* the Research and Development Board *Classification of Research Projects;* the American Society for Metals-Special Libraries Association *Metallurgical Literature Classification,* and the *Standard Aeronautical Indexing System.* There has been a revival of interest in the *Universal Decimal Classification,* in the Patent Office *Classification,* and in Ranganathan's *Colon Classification.* Western Reserve University has labored for several years and is still laboring on the development of "abstraction ladders" and "semantic factoring."

This renewed search for the solution to an unsolvable problem results from a paradox, namely, the promise of machine organization and retrieval of information, and the actual slowness of the machine in the linear searching of an index. Classification becomes one of the methods proposed for dividing an index in order to shorten the time required for a machine search.

Let us suppose we are searching for the name "Baker, Able Charlie" in a village telephone book containing about 1,000 names. To search for this name might take a minute or two, occupied with picking up the book, finding the proper page and column, and scanning the proper column for the name being sought. Now it is quite practical to utilize an IBM machine, or some similar machine, or even a deck of edge-notched cards, to find one name in a random file of a thousand names, in about the same time required for the manual search of an alphabetical file in a minute or two. But suppose we are looking for the name "Baker, Able Charlie" in a list of a million names comparable to the New York telephone book. It might take us a little longer to lift the heavier book, to find the right page and the right column, and to scan by the given names and address as well as the last name. Nevertheless, the time required for a search for one name in an alphabetical list of a million names is of the same order of magnitude as the time required to find one name in an alphabetical list of a thousand names. But a machine search for one name in a random list of a million names will take one thousand times as long as a machine search for one name in a thousand.

It was the more or less vague realization of this fact that led the early advocates of the application of punched-card machines for the organization and retrieval of information to recognize that machine methods could not be applied efficiently to the random searching of large masses of information. No machine search of a large random list can approach the speed with which the mind can jump to the exact position in an ordered list. It would be silly to randomize a list of names in a phone book, or subject headings in an alphabetical index, in order to search for any particular name or heading with punched-card machines. An ordered list when it is over a certain size always enables the mind which recognizes and utilizes the order to beat the

machine. The conclusion to be drawn here is that contrary to popular misconceptions, the larger the number of qualitatively different units in a linear system of information, the less applicable are standard punched-card systems or even magnetic tape systems to the problem of searching; and this conclusion leads, in turn, to a search for (1) ways to cut down the size of indexes; and (2) ways to profile or classify items of information.

So long as it seemed that machines could only be used for linear search of large files of information, the search for classification systems which could divide such files hierarchically or in any other way, although doomed to defeat, still appeared to be necessary. However, in recent years machine searching of literature has with rare exceptions adopted the method of look-up and coordination, rather than linear scanning, and this means that it is no longer necessary to invent classification systems in order to make machine search of information feasible or economic and practicable.

Some of those who wished to use classification in machine searching systems developed the notion of generic coding. This large mouthful means nothing more than the use of subordinate digits to indicate subordinate topics, which every student of librarianship learns in learning the Dewey Decimal system. For example, 500 is science in general; 510 is mathematics; 520 is astronomy; 511 is arithmetic; 521 is theoretic astronomy; 511.3 is prime numbers; 521.3 is orbits, etc. The advantage of such coding for machine systems lies in the ability to search by a portion of the number rather than the whole number. For example, if I search for everything on 51 — —, I pick up everything on prime numbers, without asking or knowing that anything is in the system on prime numbers. There are some people who feel that this type of generic searching is necessary for machine systems. This is most usually the case in the field of chemistry, where instead of searching for a specific compound I may wish to search for all amines or all chlorides or all purines, etc. It has been felt that the coding for any specific compound which is an amine should also contain the coding for amines as a generic group. Without going too much into detail on this matter, it can be said that this type of generic coding is totally unnecessary in order to make generic searching possible. Furthermore, it is much more expensive than other methods of carrying out generic searches. In a study of the cost of generic coding which we published in 1956[3] based upon a study of the number of digits being employed in some of the systems being experimented with by the Patent Office, we determined that generic coding would increase the size of a mechanical store by a factor of three to one, as compared to other and simpler methods of carrying out generic searches. Since that time our conclusions have been reinforced by the attempt made by the National Bureau of Standards to develop a system of generic coding for compounds. The system developed by the Bureau of Standards used so many digits that the computer was in actual fact slower in its look-up procedure than an individual turning over and examining cards in a 3 x 5 drawer.
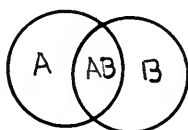
If it is the case that all classification systems so far produced or suggested have shown themselves to be inadequate as instruments of such bibliographical control, and if it is the case that such systems are not necessary for mechanized retrieval of information, why, may we ask, must we continually be faced with the problem of laying the ghost of classification or dissipating its shadows in the clear light of analysis? This has been a problem which has troubled me for some time. The issue seems so clear and yet we have this recurrent interest in and time spent on the theory and problem of classification in librarianship. I found the answer to this question in the "Report of Conclusions and Recommendations" issued by the International Study Conference on Classification for Information Retrieval, held at Beatrice Webb House, Dorking, England, May 13th - 17th, 1957. In a certain sense the classification group which has been started in this country and this Conference itself may be considered reactions to the Dorking Conference. In studying the conclusions and recommendations of this Conference, Paragraph (1), called "The Scope of Classification," gives us our clue:

Traditional classification has been concerned with the construction of hierarchies of terms - chains of classes and co-ordinated arrays. Modern information retrieval techniques also necessitate the combination of terms to express complex subjects. This conference takes the term 'classification' to include the problems raised by both these forms of relation. Some members use the term 'codification' for this field of study.

This is a complicated way of saying what earlier defenders of classification have said, namely, that all intellectual organization is classification and that even such things as alphabetical indexing or numerical arrays are species of classification. It is said that no matter how much we try to get away from classification, we must come back to it. And thus we see the Dorking Conference, which was presumably called to deal with classification as a specific method of organizing information, generalized the term so that classification became the name for any method of organizing information. We wish to do more at this point than quarrel about the meaning of words. Hence, we will admit that there is a sense in which all intellectual activity involves classification. The modern theory of arithmetic involves the notion that all numbers are classes, that is, one is the class of all classes having a single member, two is the class of all doubles, three is the class of all triples, etc., that is to say, a number is a class of classes. Further, it is certainly true that any general term involves the notion of class. Any word which does more than point or indicate this or that, is a word connoting or denoting a class. For example, I can point to a particular color, but I cannot use the term "red" without implying a class of shades, or the term "color" without implying a class of hues. When I use a man's name as the entry in a descriptive catalogue, his
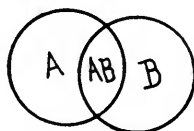
name becomes the class of all items written by him. In an alphabetical catalogue any subject heading is the class of all items which follow it in the catalogue. Certainly in this sense we must admit that all intellectual endeavor involves classification and that if we use the word "classification" in this wide sense, then all particular systems of organizing information are species of or varieties of classification. But on this point there is no quarrel nor really any reason to hold the type of Institute we are now holding. It seems to me that if we have a conference on classification, or if someone is asked to read a paper on whether classification is substantial or shadowy, there must be implied that there are other forms of organization of information, other forms of library organization, to which the term "classification" does not apply. In other words, if we say that a dictionary catalogue is a classed catalogue in just the same sense in which the John Crerar Library catalogue is a classed catalogue, then the question of whether we should have classed catalogues or dictionary catalogues becomes meaningless, sort of like saying that "A includes B and B is not included in A." This is a flat contradiction. What we must look for, then, both at the present time and in the following papers presented at this Institute, is a definition of classification which distinguishes it from other forms of organization and which permits an evaluation of classification as contrasted with an evaluation of other forms of organizing information. Unless we make this distinction, all of our discussion from now on will be shadowy and essentially meaningless. I wish, then, to offer a simple definition of classification as librarians have always used it which distinguishes it from other forms of organization. And here, if you will forgive me, we must utilize some simple logical notions to make this problem clear.

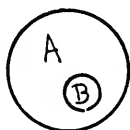(1) The product of any two classes is a class, as illustrated by the following diagram:

In this diagram A is a class, B is a class, AB is a class.

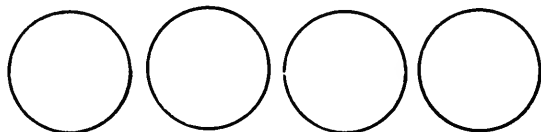(2) The sum of any two classes is a class; that is, "A or B" is a class.

(3)   Given the situation where A includes B, AB is a class, but
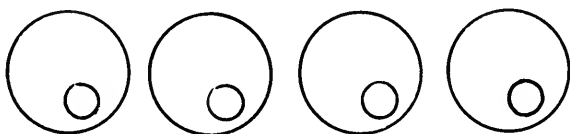the class B not A is null; that is, it has no members.

The class B is included in the class A, when all the mem-
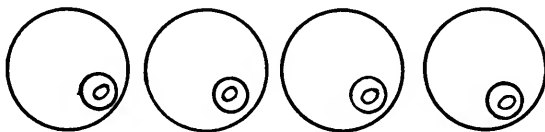bers of class B are also members of class A.

A library classification system like the Dewey system, the L.C.
system, the U.D.C. system, etc., may now be defined as follows:
There are a set of main classes, illustrated as follows:

All sub-classes are included in only one main class:

And this relation of inclusion continues, no matter how far we
carry this subdivision; thus, all sub-sub-classes are included in only
one sub-class:

It seems to me that those who defend classification systems are
saying that knowledge, books, or the information in books can be or-
ganized in this way and that an organization carried out in this manner
will serve the interests of scientific research and other intellectual
activities. In terms of logic, class inclusion is only a special case of

class intersection. For example, two standard theorems in any logical work are:

(y) (x) x∩y⊂x: The product of x and y is included in x

(y) (x) x⊂x∪y: x is included in the sum of x and y

This is equivalent to saying that class inclusion can be defined in a Boolean system of products, sums and complements.

Where, then, does the issue lie? We have first rejected the notion that classification is a purely general notion and insisted upon its distinction from other types of organization. Now it appears we have insisted on the general character of Boolean relations and have pointed out that hierarchical classification or class inclusion is only a special relationship within Boolean algebra. What issue, then, remains? For myself, I think there isn't any, but historically there have been two issues which may provide substance in addition to shadow during the coming deliberations of this Conference. There have been metaphysicians, philosophers, and even some scientists, notably certain botanists and zoologists, who have insisted that in addition to the mathematical notion of class there do exist in the world real classes or archetypes. These men would say that the class of geraniums is much more real than the class which anyone may set up which has as its members any two flowers, e.g., a geranium and a rose. These men would say that the class of red things is more real than the class of colored things. Following this line, it would be said that scientific investigation will disclose that the universe and all the items in it are organized in a set of real classes and that the business of library classification or any other type of classification is not to make classes but to discover such classes. It is my present feeling that there are no serious scientists who still hold this position, at least not since the development and popularization of the theory of evolution and since the development of Boolean algebra in the middle of the Nineteenth Century. Let me remind you that it is traditional in library literature to recognize that Dewey was very much influenced by Harris, that Harris was an Hegelian, and that Hegelians are a species of unscientific German metaphysicians who believe that all reality is constituted by an hierarchy of classes reaching up to the Prussian State as the class of all classes. I would say further that the emphasis on real classes in this sense in librarianship is a cultural lag which should be eliminated at this time.

There remains one other problem. It might be said that an empirical investigation of how men actually organize knowledge or write books discloses that some classes are better than others and that some classes include other classes and that a good library organization should reflect this empirical fact of how people study, do research, or use libraries. This is a valid point of view and if the empirical facts could be demonstrated, then a library classification based upon such empirical facts would certainly be useful. On the other hand, if the librarians make classifications for themselves based upon theo-

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retical considerations and insist that the users of libraries modify their own interests or own groupings in order to fit the librarians' theoretical classifications, such a procedure would have no warrant in either fact or logic.

Notes

1. J.J. Lund and Mortimer Taube, ''A Non-Expansive Classification System,'' *The Library Quarterly,* VII (July, 1937) 373-394.

2. M. Taube, ''The Functional Approach to Bibliographical Organization,'' *Bibliographic Organization,* (Chicago: University of Chicago Press, 1951), pp. 57-71.

3. M. Taube and Associates, *Studies in Coordinate Indexing,* Vol. III, (Washington: Documentation Inc., 1956), pp. 34-57.

The Classified Catalogue
as an Aid to Research

Herman H. Henkle
Librarian, The John Crerar Library

Very little is known about the effectiveness of library subject cat-
alogues as tools of research. We know that they are indispensable
from a theoretical point of view, and from general observation of
their use and the results of a few studies we can conclude that they
are generally compatible with the library use habits of readers.

Some of the general conclusions which have been drawn from stud-
ies of the subject catalogue are: that there is no significant difference
between the amount of author catalogue use and subject catalogue use;
that the non-specialist ordinarily will make more use of the subject
catalogue than the specialist; and that most of the use of the subject
catalogue is for materials in English and of fairly recent date.[1]

If the second of these generalizations is true, namely that subject
catalogue use is primarily by non-specialists, a discussion of the
classified catalogue as a research tool may be a somewhat sterile
exercise. On the other hand, we can remind ourselves that the im-
portance of research isn't determined by popular vote, so even a mi-
nority use should justify its consideration. In any case, classifica-
tion and classified catalogues have a high degree of relevancy. This
was my reason for agreeing to discuss the subject of the role of the
classified catalogue in research.

In evaluating what I have to say about classification, one general
caveat must be observed. My remarks on classification will relate ex-
clusively to its use in the classified catalogue. While some points
might have relevance to the classification of books for shelving, others
might have differing relevance or no relevance whatever. No effort
will be made here to indicate when there is or is not a common ground
in problems of shelf classification and the classified catalogue.

A second caveat is that the limitations of my experience with the
classified catalogue probably lend my judgements on its problems and
potentialities much less validity than they should have. I am aware of
the existence of several other classified card catalogues in current
use, but I have had no opportunity to examine them. All of what I have
to say is derived from experience with the classified catalogue of
Crerar Library. This being the case, I should begin with a brief des-
cription of this catalogue.

The first librarian of Crerar, Clement Walker Andrews, was a

chemist by first profession, and prior to accepting appointment to establish a new library of science and technology in Chicago (in 1895) had been serving as librarian of the Massachusetts Institute of Technology. He was, then, by both profession and experience, science-oriented. He was working, also, in a period when there was an active and rising interest in classification. Whether these factors were the cause or only coincidences, he decided that the subject catalogue at Crerar would be a classified catalogue; and he chose to base it on the flourishing classification system developed by his contemporary, Melvil Dewey.

The catalogue consists of a classified section with an alphabetical subject index filed as a separate section immediately before the first sections of the classified catalogue. The labels on the catalogue trays are class numbers. In the trays, cards are arranged by class numbers in the upper left corner of each card (call numbers are on the right); guide cards indicate breaks between classes (but not all of them); and within each class, the cards are arranged chronologically by date of imprint with the latest date first, followed progressively by earlier dates toward the back of each tray.

A crucial part of the classified catalogue system is the numerical index, a classified card file maintained in the Catalog Department on which a record is kept of every verbal heading in the subject index which refers to each specific class number. In effect the subject index in reverse, it provides guidance to the cataloguer in the development and maintenance of the subject index.

The late Harriet Penfield, for many years chief classifier at Crerar, once wrote that Mr. Andrews considered the basic factors in the classified catalogue to be "(1) time, (2) geographical, and (3) alphabetical sub-arrangements, and these have been built into the catalogue from the first and are characteristic of it." This is quoted from some manuscript notes Miss Penfield prepared at my request before her retirement.[2] Further quotation will serve to round out a general picture of the catalogue.

> Of first importance also was more adequate provision of schedules, for the Library grew very rapidly, and both the L.C. and D.C. schedules were very meagerly developed in the nineties. Accordingly, the *Brussels Classification* was adopted for most sections of the social sciences [no longer included in Crerar collections], and the *Zurich Consilium Bibliographicum* for 59 Zoology and some parts of Biology . . . . Other expansions were worked out or adapted from other sources very early, and from time to time later as needed, though if another edition of D.C. was promised soon we tried to wait . . . . Sometimes, too, we have not liked a new D.C. expansion any better for our purpose than our own and have made no effort to adopt it in whole or in part. We also have avoided the over-elaborateness of some of the later D.C. editions.

The general pattern of the catalogue was continued along its original lines through most of the first six decades of the Library's history. But by 1950 we had reached the conclusion that the catalogue should undergo a thorough review. Obviously this would be a major undertaking, and might take a long time. Yet it was realized that a beginning must be made. Substantial progress has been made in a decade,[3] but there is still a vast amount of work to be done—made doubly difficult by the fact that the frontier of science and technology is constantly changing at a rate that exceeds our capacity to keep fully abreast of it.

One of the evidences of need for change in current policy was the statement just quoted from Miss Penfield's notes, namely: "We also have avoided the over-elaborateness of some of the later D.C. editions." This statement, we believe, reflects a serious misconception of the principle of the classified catalogue. It equates use of classification in the catalogue with classification for the shelving of books. Very strong reasons can be advanced for brief notation in shelf classification, but they are not applicable to the construction of the classified catalogue. They lead, in fact, to basic violation of the principle of specificity in any type of subject indexing. And it is essential to keep in mind that classification for use in a classified catalogue is not classification of books, but subject indexing by means of class symbols.

Support for the position taken came from a number of what we referred to as test cases. These involved random selection of an index entry followed by analysis of what was found in the classified catalogue. Two test cases will be described.

TEST CASE ONE

Index Entry

Corn oil
665.3 (Chemical technology)

Classified Catalogue

665.3 (Vegetable fats and oils)
This section was comprised of some 193 cards, including the following subjects, not in any systematic order, and the index entries referring to 665.3. The number of cards follows each subject; an asterisk indicates that there was an index card, but no reference to 665.3.

(General) 96, including 5 on waxes	Olive oil 21
Cocoa oil 11	Palm-oil 9
Corn oil 4	Peanut 1
Cotton seed 16	Peppermint 2
*Flaxseed 2	Soybean 12
*Kaoline 1	Sunflower seed 1
Karite 2	Turpentine 4
Maize 2	Wormwood 1

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Index entries recorded in the Numerical Index were checked and grouped under three headings, excluding entries discovered through examination of the cards in the classified catalogue under 665.3.

Recognizable Synonyms

Absinthium, see Wormwood
Cocoanut-oil, see Cocoa-oil
Corn
Corn, Indian
Eupatoriaceae (Wormwood)
Indian Corn
Saponification
Shea-butter, see Karite

Entries for which no titles were identified

Argan
Castor-oil
Colza
Forest products
Rape plant
Rapeseed
Wax-palms
Zea mays

General Index Entries

Fats, Vegetable
Oil seeds
Oils, Vegetable
Vegetable fats
Vegetable oils

What is wrong with this picture? First, and most important, a classified catalogue based on this pattern produces, in much too large numbers, references comparable in part to what the machine men call "false drops." Under the class, 665.3 (Vegetable fats and oils), there are catalogue entries for 193 publications. The index entry for "corn oil" refers us to the class, 665.3. Here we find *four* books dealing with corn oil and *one-hundred-eighty-nine* false drops.

There are at least three other undesirable conditions illustrated. (1) For three subjects—the oils of flaxseed, kaoline and peanuts,—there are titles listed under 665.3, but this class is not referred to on the index cards for these oils; (2) for a number of special kinds of vegetable oils there are index entries referring to 665.3, but no titles for these oils in the classified catalogue; and (3) three index entries

are disclosed to be cross-references—a negation of the advantage of-fered by the classified catalogue of being able to use in the index any number of synonyms for a subject as *direct* references to the appropriate section in the classified section of the catalogue.

The one thing right about the picture, and this a very important rightness, the general index entries for vegetable fats and oils referred to 665.3 where the reader finds, or should find, all monographs in the collections which relate to this general class.

The ultimate solution to the primary wrongness of the picture can only be, in terms of class notation, a specific class number for each type of vegetable oil and fat. Another possibility is alphabetical arrangement of the different oils under 665.3. This solution is effective only in the absence of synonyms, except by the admission of cross references in the index; but it does offer an immediate partial relief for the difficulty. Still another possibility is to incorporate terms as modifiers of the class number referred to by index entries, in order to eliminate the necessity of cross references in the index. If this were done the index entry for Cocoanut oil could refer to ''665.3: Cocoa oil (Vegetable fats and oils):'' and the specific titles on this subject would be readily located by the subordinate guide card, cocoa oil, under the general class guide card, 665.3 Vegetable fats and oils.

TEST CASE TWO

Here we examine a section of the classified catalogue in which there has been completed an extensive revision. Prior to the revision, plastics were classified under a general number for ''gums, resins and plastics,'' similar to the type of general class described under Test Case One. In revising plastics were separated from gums and resins and distributed under an expanded classification schedule.

In the alphabetical index to the classified catalogue, index entries for subjects which have undergone such revision are on a different colored card stock than older entries. The index now contains 125 entries under Plastics or subdivisions of the general subject, referring to 100 different class numbers in the classified catalogue. Four of these sub-classes, in addition to the general entry Plastics, were chosen for examination.

Index Entries

```
Plastics
   016.678   (Bibliographies)
   313.678   (Statistics)
   678       (Manufactures)
Plastics—Accessory materials—Solvents
   678.042   (Plastics technology)
Plastics—Additives
   678.04    (Plastics technology)
```

Plastics—Additives—Dyes
    678.047   (Macromolecular materials)
Plastics—Additives—Plasticizers
    678.049   (Macromolecular materials)

Classified Catalogue

1. 678   Plastics (Manufactures).
    Under the general class number are filed eighty-nine titles.
    Even here, there are some titles with special aspects presented,
    such as chemistry of polymers or machinery for moulding plas-
    tics. Cards for such titles normally appear, also, under other
    classes. For example, some titles recorded here are also found
    under 541.74 (Polymerism).

2. 678.042   Plastics—Accessory materials—solvents.
    Two books (different editions of the same title).

3. 678.04   Plastics—Additives.
    One book dealing principally with solvents. Probably, should
    have been classed under 678.042. Some questions might be
    raised on the appropriateness, either of the parenthetical ref-
    erence in the index entry, or of the position of solvents in the
    classification schedule.

4. 678.047 Plastics—Additives—Dyes.
    One book.

5. 678.049   Plastics—Additives—Plasticizers.
    One book.

    In this test case we find that most of the deficiencies exposed in
Test Case One have been corrected. Particularly important, it is now
possible for the user to go directly from index entries to class num-
bers which cover only material related to the subject of the index en-
try.
    One of the aids for which we early felt a need was a manual of
practice for the construction and maintenance of the classified cata-
logue. We struggled with the problem for a time on our own, but
finally requested financial assistance for the project from the
Rockefeller Foundation. A grant was received, and editors were en-
gaged to write a guide. Dr. Jesse H. Shera and the late Margaret
Egan worked closely with the Crerar staff and the results of their
work appeared as a publication of the American Library Association.[4]
It received one blistering review and a number of favorable notices.
It represents one stage in the work on improvement of the classified
catalogue which we were pleased to see realized. Its availability
eliminates the necessity of repeating here much additional informa-
tion needed fully to understand the characteristics and functioning of
the classified catalogue.

There are a number of additional comments which can be made to throw light on the classified catalogue as a research tool, and on some of the considerations which should be taken account of to make the catalogue fully effective: (1) need for information on use of the classified catalogue, (2) up-to-date classification schedules, (3) perspective of the Library's holdings in any particular subject through the classified catalogue, and (4) the high degree of expertness required of personnel responsible for maintaining the subject catalogue.

I know of only one study which is concerned with determining how the classified catalog is used by readers. This was conducted as a master's study at the University of Chicago, by Emmett McGeever, then a member of the Crerar Library staff.[5] He sought information on the ratio of books found through the classified catalogue to total book use, whether certain classes of readers used the classified catalogue more than others, recency of items, extent of foreign language titles, and extent of serials requested through use of the classified catalogue, and what kind of difficulties were experienced by readers. The general assumptions which he wished especially to test were:

> . . . that the classified catalogue is used for subject access to scientific and technical literature by the less experienced searcher of the literature, who is not competent to take advantage of the precision of the classified catalogue; and further, that the use of the classified catalogue is a very low part of the total catalogue use.

In the overall number of requests for books, 77.1% resulted from use of the author-title catalogue, and 22.9% from the classified catalogue. This result appears to differ sharply from previous conclusions that use of subject and author-title catalogues is about the same. On the other hand, McGeever had anticipated an even lower percentage, and concluded that for even 22.9% of use of the collections to result from the classified catalogue was a very significant proportion of the total use.

On the other hand, the first assumption which he wished to test was strongly supported by the results, namely that the classified catalogue is used by less experienced searchers of the literature. It was shown that 14.1% of all books requested by subject resulted from use of the classified catalogue by high school students. In reality, this percentage is much more significant than McGeever realized. During a general study of reader use at Crerar late in 1958[6] it was learned that only 3.8% of the total amount of reader use was by high school students. This means that only 3.8% of total use accounted for 14.1% of books requested through use of the classified catalogue. It is also significant to note that McGeever's study showed that 88.3% of the books requested by high school students were located by the students through use of the classified catalogue. In light of the further observation that all use of this catalogue was accomplished with very little

assistance by reference librarians, it seems justifiable to conclude that the classified catalogue can be effectively used by readers relatively unschooled in the technical aspects of catalogue construction.

We might glance briefly at some of the conclusions reached on some of the other questions asked by McGeever as part of his study. There was no significant difference in dates of publications of books selected by use of the author-title catalogue and the classified catalogue. Of foreign language requests, 13.5% of all use was in this category; but the comparable figures for the two catalogues was 16.1% from the author-title catalogue, only 4.9% from the classified catalogue. An even more striking variance was shown for serials. For requests originating from the author-title catalogue 86.9%; only 8.8% from the classified catalogue.

Our interest here, however, is in use of the classified catalogue as a research tool. For this reason, it may be of greater interest to look at classified catalogue use by other reader groups. To refer again to our 1958 survey of reader use,[7] we know that use of the collections by the public is about equally divided between students, professional groups, and technical employees of companies. Of non-student users less than 3% are "general interest" readers. The major proportion of student use, 82%, is by college and university students, with the ratio between undergraduate and graduate students being approximately 3:4. Of non-student readers, the great majority are serious users of the collections, again about equally divided, in this case between employees of companies using the library in connection with company business and professional workers in engineering, chemistry, medicine and other areas pertinent to the scientific and technical fields covered by the Library's collections. From these figures it is seen that a very high percentage of book use by readers relates to serious pursuits.

We might look, then, at one further result of the McGeever study. While his analysis of use of the classified catalogue by groups other than students was not extensive, he did find that the amount of such use is very significant. For example, users of the catalogues engaged full-time in use of the library located 29.4% of the books requested through the classified catalogue. For those whose principal job is library research, the percentage is 24.1%; and for those a minor part of whose job is library research the percentage is 18.1%. And these percentages represent use of the classified catalogue in its present state of imperfection.

It is obvious from such evidence that we are justified in taking very seriously the responsibility for making the classified catalogue the most effective tool possible, but are faced by problems inherent in accomplishing this objective.

Because of the requirement of specificity for greatest effectiveness, it is necessary to have classification schedules which follow closely the new developments in the subject matter of our collections. The following information shows the universal character of this problem.

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Problems of construction of the classified catalogue cut across all disciplines within the scope of the Library. For example, the 1958 reader use survey disclosed a distribution of book use by broad classes as follows: basic sciences 34%, technology 37%, medicine 26%, other subjects 3%. Furthermore, active use by every reader group cut across all three of the major sections of the collections. Only in analysis of subject use by particular professional groups do significant differences become evident. A few examples from a separate analysis of book use by professional groups are pertinent.

One might expect chemists to range widely among the subject classes, and this was shown to be the case. Of professional use accounted for by chemists, the percentages for the three major subject groups were basic sciences 26%, technology 17%, and medicine 6%. Engineers and physicians would be expected to exhibit more specialized interests. They do. Of professional use of medicine, 25% was by physicians, only 3% by engineers. Of professional use of technology, 36% was by engineers, less than one percent by physicians. On the other hand, use of the collections by lawyers, although relatively low, is significant, and is about equally distributed among basic sciences, engineering, and medicine.

The pertinence of this analysis is that in the continuing review of the classification and of the classified catalogue, no major discipline can be slighted. The review must take place along the broad front of all sciences and technologies.

Another problem derives from the need to have the classified catalogue serve well the value of presenting in perspective any given subject in relation to other sub-groups of any general class. One of the conditions which makes this difficult is the large volume of material which finds its way into the catalogue. It would be desirable, from the point of view of this requirement to have numerous subjects represented on display by guide cards in any given catalogue tray. This is often prevented by cards for one or two subjects so numerous that they fill one tray and sometimes extend into another.

One possibility which occurs to us in this situation is to reduce the number of cards. The feasibility of this is suggested by the natural obsolescence of scientific publications in earlier years. The survey of reader use, to which reference has been made, showed that cards for earlier publications might be removed from the classified catalogue without materially reducing the value of the catalogue with respect to coverage. For example, the statistics of use by date of publication showed that only about five per cent of total use of the collections was for titles published before 1900. And it is quite possible, that further analysis of books requested through use of the classified catalogue would show that imprints of much later dates for many subjects could be removed. As a matter of fact, there is already some evidence in the McGeever study to support this thesis.

For the purpose of presenting a perspective of any given subject in relation to other sub-groups of any general class, another alterna-

tive is to print class lists for use of readers in different subject fields. This has not been done at Crerar Library, but it is being given serious consideration.

Two related problems are of giving an overview of holdings relating to a given industry, and an overview of the scientific and technical literature relating to a given region. Neither of these is adequately provided in the typical alphabetical subject catalogue. The first is only inadequately provided in the classified catalogue. The major class for technology of an industry has the primary material organized in its various sub-classes, but related material in other fields can be traced only through use of the subject index. The second problem of display, however, is dealt with in the Crerar Catalog by use of appropriate place numbers in the 900's (not used at Crerar for general history), followed by subject numbers, within parentheses, for scientific and technical developments in the place or region.

Still another, and final, problem that has a high degree of relevance to constructing effective classified catalogues is the heavy requirement placed on classifiers for subject specialization. It may be tnat the solution to this problem is to draw into the classification activity the expertese of more, if not all, members of the library staff. We are exploring the possibility of this in our own organization. We have about a dozen professional staff members outside the Catalog Department who have sufficient knowledge of one of more areas in science and technology to make a major contribution to such a program. And we now have plans in the making to initiate a staff seminar on classification to explore the best procedures for utilizing this special knowledge to the benefit of the classified catalogue.

Notes

1. C.J. Frarey, "Studies of the Use of the Subject Catalog; Summary and Evaluation," *Subject Analysis of Library Materials,* ed. M.F. Tauber (New York: Columbia University School of Library Service, 1953), pp.147-156.

2. Harriet Penfield, "Fifty Years of the JCL Classified Catalog" (nine page manuscript in Crerar Library archives, 1952)

3. May I add a footnote here to the credit of Miss Penfield, whom I greatly admired. Still alert for the late seventies, when she retired, she was uneasy to see such a fundamental change in the character of the catalogue take place, but readily agreed that it must be.

4. Jesse H. Shera and Margaret Egan, *the Classified Catalog: Basic Principles and Practices* (Chicago: American Library Association, 1950)

5. Emmett B. McGeever, "A Study in the Use of a Classified Catalog" (Unpublished master's thesis, Graduate Library School, University of Chicago, June 1928)

6. "Survey of Reader Use of the John Crerar Library" (Chicago, September 1958, Mimeographed report in process of revision).

7. *Ibid.*

A Classification
for the Reader

Ruth Rutzen
Director, Home Reading Services
The Detroit Public Library

Our library literature is replete with statements that indicate that
the goals and functions of the public library are vitally concerned
with the interests and needs of people in general. In fact our most re-
cent statement, as found in *Public Library Service* says in part: the
library's function "is to assemble, preserve, and make easily avail-
able to all people the printed and other materials that will assist them
to:

Educate themselves continuously
Keep pace with progress in all fields of knowledge
Become better members of home and community
Discharge political and social obligations
Be more capable in their daily occupations
Develop their creative and spiritual capacities
Appreciate and enjoy works of art and literature."[1]

Are classifiers and catalogers concerned with pronouncements
such as these? Or has it been assumed that a shelf arrangement
which stems from a classification which is a systematization of know-
ledge and originally was aimed at a service for scholars and special-
ists can logically be used by another service in libraries whose pur-
pose is primarily planned to provide the popular education services
for the general reader?

The well-established classification and catalogue departments in
large libraries make it seem efficient to class a book for a large
main library collection or for a series of special departments, and
then apply this same classification number for the book in branch li-
braries. This appears to be the quick and cheap way to do it. In the
smaller independent libraries the suggestions for class numbers made
by the H.W. Wilson Company, the A.L.A. Booklist, or maybe by the
Library of Congress, frequently aid the busy librarian to organize a
collection.

In 1937 in her book, *The Classification of Books; an Inquiry into
its Usefulness for the Reader,* Dr. Grace O. Kelley, originally a clas-
sifier and later a reader's consultant, highlighted the pitfalls of so-

called close or specific classification.[2] Those of you who remember her book will recall her great concern with questions such as these: Why do the methods of classification of books bring to light so small a proportion of the library's total material on a definite subject? Or why are the books on the subject in which one is interested scattered in so many places on the shelves? In speaking of her experience as a reader's consultant in a large public library she states repeatedly that to assemble books on subjects according to the way they had been asked for by readers and according to the USE that was to be made of them, it was almost always necessary to gather them from many places in the classification system.

Visualize then if you can a non-fiction collection of 15,000 or fewer books bearing class numbers which originally were assigned to books in collections four or five times that large or for specialized departments. Imagine the kind of books that stand next to each other in a bookmobile under even a fairly simple Dewey classification.

I think we will all agree that we have attempted to overcome the hazards of shelf arrangements which stem from a Dewey-organized collection by means of booklists, displays, more displays, exhibits, etc. This can become what I call the bargain basement approach. The English librarian Ernest A. Savage produced a whole book titled *Manual of Book Classification and Display*[3] in which he has a chapter, "The Home Reading Library as an Exhibition of Books", which provides detailed descriptions of equipment and methods for displays. An interesting but not too helpful a book for us. We question seriously whether these devices will ever be sufficient to overcome what may be improper organization of material to begin with—improper for accomplishing our frequently stated goals and objectives, these goals so succinctly stated in the *Post-War Standards* and again stressed in our new guide, *Public Library Service*.

In the Detroit Public Library the responsibilities for these popular education aspects of the service have been delegated to the Home Reading Services as represented in the branch libraries and the Home Reading Department at the Main Library. The special departments of the Main Library provide chiefly reference and research services with a heavy emphasis on subject specialization. We in the Home Reading Services also have a specialty—it is that of being generalists. By that we mean that we have a working knowledge of good books in all fields. We select our own materials and we believe we need our own organization of those materials.

The Detroit Public Library's interest in a Reader Interest Classification goes back to 1936 when Mr. Ralph Ulveling, then Associate Librarian, addressed a communication to branch librarians about an experimental arrangement. In it he said:

For some time I have wondered whether our popular book lending service as organized on traditional lines is pointed directly enough toward our service objectives; that is, whether the

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organization of our circulating units is adapted to the function we are trying to fulfill.

Interestingly enough it was in 1937 that *People and Print* by Douglas Waples was published. In it he made the observation that a "psychological classification" of books was needed which would relate the peculiar appeal that books make to readers of a given description to that appeal. He also said that for a book "to pass from the stacks of a library . . . . to the reader's hands the publication must be advertised . . . . It must escape the oblivion of the general catalogue or open shelf and come to the prospective reader's attention."[4]

In his thesis on the purpose and administrative organization of branch libraries, Lowell Martin repeatedly points to the necessity for recognizing in the branch library different goals and functions than in the main library. He says about the branch:

No longer can it look passively toward a continued role as a poor copy of the main research and reference center. Rather it faces a distinct task as an agency for distributing that portion of popular educational, cultural, and recreational literature which the policies of the institution dictate . . . . The branch is . . . . to be treated not as an imitation of the central library—differing only in scaling down of standards.[5]

Later he says,

The number of potential general non-fiction readers may be so great and service to them so important that a considerabele section of the book stock should be removed from the conventional classification scheme and rearranged in terms of the reading interests of this group.[6]

I have used these fragmentary quotations to introduce the Reader Interest Classification to show that our experiment is not merely a scheme arbitrarily designed to do something different. It is a sincere attempt to overcome hurdles in public service long recognized by others.

WHAT IS THE READER INTEREST CLASSIFICATION?

It is a book arrangement that recognizes the variety of reasons prompting people to come to the library. It is not a classification of the fields of knowledge but a shelving arrangement based on broad areas of interest which relate themselves to the needs of people. These broad areas have been designated as interest categories. They are subdivided by a varying number of sub-headings, depending on the type of category and the size of the collection. Some categories are browsing sections for the general reader; others are subject groupings aimed at a particular use by the reader.

In setting up what we have designated as browsing categories we have had in mind: (1) the readers who have no fixed needs in mind but who are stimulated to recognize their interests by the category indicating a broad general field; and (2) those who are conscious of their interest in certain fields and can associate it with definite subjects but not with related interests.

In setting up the so-called subject categories we have in mind the reader who comes to the library for help with a particular need but not necessarily a specific request. In large part the practical books concerning family life, vocational and avocational subjects fall here.

HOW IS THIS ARRANGEMENT DETERMINED?

We begin with a consideration of people, their interests and needs—not with the contents of books alone. What are the primary interests and needs of people? We said that your interests and mine had roots in these large areas: (1) the improvement of ourselves as individuals, culturally, socially, and vocationally; (2) our involvement and participation in the affairs of our primary social unit, the home; (3) our concerns stemming from our relationships and responsibilities to our community whether local, national, or international.

We were interested in a statement which we found in a speech by Mr. C. Scott Fletcher, President of the Fund for Adult Education, published in a pamphlet titled *The Great Awakening*, which appears to corroborate the above statement. He says:

> The individual must be prepared, not just to work, but primarily to live—at the same time both a unique person and a fellow member of the human race. His various lives intermingle. The major roles of the individual are three: in the *home*, on the *job*, and in the *community*.[7]

We have written brief statements on the purpose and content of the fourteen categories now accepted as standard. Time will not permit a full reading of these but you have in your hand a statement titled "The Reader Interest Book Arrangement in the Detroit Library" which, beginning on page two, lists all fourteen categories with suggested subheadings. I will refer here only to the few categories and sub-headings for which sample shelf lists have been distributed. The first sheets indicate authors and titles of selected sections of the shelf list for the three sub-headings normally found under the general category CURRENT AFFAIRS. Our statement for this category reads:

Purpose: This is a browsing section to serve the adult reader interested in the present-day world—politics, economic trends, and social problems.

Content: This section must be kept small and up to date. The division between national and international affairs will be

arbitrary. The sub-heading *Trends in Science* should contain only those books which are directed toward the reader as a citizen, and not as a student.

The next shelf list sample shows the sub-heading *Child Care* under the major category YOUR FAMILY. For the category YOUR FAMILY we said:

Purpose: This is basically a subject section aimed at parents interested in books that pertain to the family and its members.

This sheet for the sub-heading *Child Care* shows readily how pertinent books in the general field are scattered under Dewey.

For the category PERSONAL LIVING we stated:

Purpose: This is a section concerned with the reader's interest in himself as an individual. It serves the browser primarily, with books of inspirational value and practical help.

Content: Includes popular psychology, some biography, books of personal religion and biographies of religious people, which will help the individual in his personal, spiritual, and emotional development, self improvement with some emphasis on the social graces, grooming, manners, and conversation.

For this sample selection from the shelf list we chose a listing for the sub-heading *How to Retire*. The sample selections from the shelf list show how the material on this new and ever-growing subject can be made useful for the many people now concerned with retirement. Like *Child Care* this is a subject that gets rough treatment under Dewey.

Large holdings are found in the category PEOPLE AND PLACES. About it we said:

Purpose: A browsing collection of readable books for those who prefer real life stories and experiences to fiction.

Content: This includes much popular biography, descriptive travel, and personal experiences. Since this is a browsing section, purely informational matter though it may fit geographically or historically should be in the INFORMATION category to which we refer later.

The samples chosen to illustrate this category picture the kind of books to be found under the sub-heading *Adventure* and another labeled *Law and Justice*.

The next sheet is for the sub-heading *House Plans* from the category YOUR HOME.

Purpose: This is a subject section bringing together all books relating to the house and how to live in it.

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We had more arguments about the wording for the category THE BRIGHT SIDE than for any other category. We are not too pleased with it now. But several years use of it has achieved an identity for and it is now generally accepted. It is supposed to be for the person who is in the mood for something amusing. It is the gay, chatty, humorous satiric. It may be fiction, plays, essays, biographies. *Cheaper by the Dozen,* a Thurber anthology, and Emily Kimbrough rub elbows here. There are no sub-headings for this category. The sheet indicates that biography, fiction, even travel, besides humor are good additions to this category.

The response of the public to the category BACKGROUND READING is always most heartening. Our statement for it is:

Purpose: A browsing section of books which will contribute to broadening the reader's cultural background and knowledge, arranged alphabetically by author.

Content: Important books of the past which have stood the test of time, the classics, including novels, plus the serious, modern books which are important now. These books must meet a high standard of literary quality and appeal to the person capable of concentrated reading.

The last sheet tells a story of what may be found in it.

I will take no more time to describe other categories, but I must refer to the three which hold the bulk of the informational materials. They are TECHNOLOGY, BUSINESS, and INFORMATION. Ordinarily TECHNOLOGY and BUSINESS will have five to ten sub-headings. The number of INFORMATION will range from thirty-five to fifty or more depending on the collection. We describe these as subject categories containing factual material and textbooks for answering specific questions. Some of this factual material may cover the same subjects as are represented in the browsing sections. Books which are no longer popular or timely but have an informational value may be transferred from the browsing sections to the INFORMATION category.

HOW ARE BOOKS FOUND?

Let me assure you every book has a fixed place on the shelf and only one place. The catalogue locates every book under author, title, and subject like any other catalogue.

Each category is assigned a letter, such as G for YOUR HOME. Each sub-heading has a number, such as 2 for entertaining, 4 for cooking, etc. In assigning these numbers space is left for additional sub-headings by skipping numbers. Within the sub-heading the arrangement is an alphabetical author arrangement.

This designation of letter and number is written in the inside back cover of the book and is stamped on top of the book. A six-band crown

dater, which carries all the letters of the alphabet and four bands of numerals, makes possible use of far more combinations of letters and numbers than we will ever need.

Large category signs designate the location of each category on the shelves. Sub-headings are shown on small sign holders (we use Princeton files) by title of the sub-heading and its numeral.

Each branch is provided with rubber stamps for the category designations. The catalogue card is stamped with the name of the category and the numeral of the sub-heading which applies to the book.

A borrower using the card catalogue can readily spot the category sign and, reaching the shelves, will quickly locate the sub-heading marker numbered for the title he is seeking. The many people who do not use the catalogue are quickly alerted to material of interest and significance for them.

At present the branch librarian and her staff determine both the category and sub-headings. An important aspect of this is that the local staff members have given consideration to the potential use of the book and the needs and interests of the individuals they serve. A significant by-product is increased book knowledge for the staff working with the people.

Can the central catalogue department take over this work? I see possibilities for some well trained person with experience in the home reading services taking over assignment of books to the categories. But the size of the collection and knowledge of the community in which the branch operates I believe will necessarily keep the selection and designation for sub-headings in the branch.

HOW THE ARRANGEMENT SERVES THE LIBRARY

I want to make these points:

1. The Reader Interest Arrangement separates those books purchased to meet the general reading needs from the mass of books accumulated to serve the informational services of the library. Mixed shelving of these tends to bury and conceal the interesting titles from the potential reader for whom they were bought.

2. Book selection will be affected, because each title gets consideration in terms of its contribution to specific areas of interest and USE.

3. Both holdings and use of each category and sub-heading are readily obtainable, for example on October 24, 1959 we easily assembled the following figures from branch libraries, concerning holdings and circulation:

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Chase Branch
    BACKGROUND READING       -       404 books,  42% out
    YOUR FAMILY              -       561 books,  35% out
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Hubbard Branch
    BACKGROUND READING   -   359 books, 47% out

Jefferson Branch
    YOUR HOME   -   1,118 books, 31% out

Edison Branch
    CURRENT AFFAIRS   -   218 books, 55% out

Chaney Branch
    BUSINESS - Sub-Heading
    Management & Supervision -   60 books, 35% out

These figures show that Jefferson Branch does not need to build its collection on YOUR HOME except for new and exceptional titles. Perhaps it should do some weeding. Edison Branch definitely needs to build its collection on CURRENT AFFAIRS.

4. Both additions and withdrawals of books can be more safely determined.

5. The best collections are developed as new collections when the original purchases are determined with this arrangement in mind.

6. It is possible to reorganize Dewey classified collections. Interesting problems stem from the fact that some books will not fit anywhere. If they no longer have a good general appeal and do not represent sound information, they should be withdrawn.

SUMMARY

Detroit started this experiment in the early 1940's with an alcove in the Circulation Department of the Main Library. Since 1948 six new branch collections have been organized with this pattern and thirteen older collections have been reorganized, one is now in the process of complete reorganization, several have set up a partial plan. Work has not started in the three largest branches having 40,000 or more books.

We have no hesitancy in transferring assistants from a Dewey-organized branch to a Reader Interest branch, and vice versa. However, once a branch librarian or an assistant has worked with the Reader Interest system he is always impatient with the Dewey system. It is the staff that has given the system its impetus in Detroit.

In closing let me refer to a statement by Dr. Das Gupta of the Delhi University Library, India, in his report on his visit to American libraries, published in *Annals of Library Science,* September 1956:

In the branches and in one department of the Detroit Public Library the organization of books on shelves is based on an engaging pattern of classification, derived from the basic interests of human life. Logically it involves cross-classification and,

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therefore it is not Artistotelian. The ordinary schemes of bib-liographical classification have one feature in common. They are analytical and they attempt to divide knowledge into mutually exclusive fragments. But a man's life is not fragmentary. For example, when people marry or set up a home or have children, the complex of their interests is as whole as life itself. To them the effect of any analytical schemes of classification, however broadbased, looks 'disorganized'. It is not less of classification that suits them better. They need a different kind of classification and more of it, with well-articulated, well-formed and well-organized details. The Detroit scheme of classification is a fine example of what the right kind of technique in its right place can achieve to liven up a mass of books in such a way that the arrangement itself communes with life. Such a classification helps the ordinary reader. It trains the librarian to see all-together the many lines of interest that pass through the nodal points of life, to assess from the use of books whether the library really has its roots in the community, and to develop concrete and humane notions of book selection and book service. Being, however, limited by its own relevant purpose, the readers' interest classification is not intended to be used to organize large collections of books for multipurpose use, for which analytical schemes of classification are better suited.[8]

We think Dr. Das Gupta has done a better job than we did in expressing the purpose and results of the Reader Interest Book Arrangement.

Notes

1. *Public Library Service* (Chicago: American Library Association, 1956) p. 31.

2. Grace O. Kelley, *The Classification of Books, An Inquiry into its Usefulness to the Reader* (New York: H.W. Wilson Co., 1938).

3. Ernest A. Savage, *Manual of Book Classification and Display for Public Libraries* (London: George Allen & Unwin, 1949).

4. Douglas Waples, *People and Print, Social Aspects of Reading in the Depression* (Chicago: University of Chicago, 1937) p. 37.

5. Lowell Martin, "The Purpose and Administrative Organization of Branch Systems in Large Urban Libraries" (M.A. thesis Graduate Library School, University of Chicago, mimeographed), pp. 8-9.

6. *Ibid.* p 64.

7. C. Scott Fletcher, "The Great Awakening" *Southern University Conference* 1958 (Chattanooga?: (1958) p. 32. Note: the text is slightly different from the text in the pamphlet.

8. S. Das Gupta, "American Libraries, Some Impressions," *Annals of Library Science* III (September, 1956) 97.

The Enduring Qualities of Dewey

Heartsill H. Young
Assistant Librarian, University of Texas

It has been many years since Melvil Dewey's *Decimal Classification* has been discussed before a group such as this. In the nineteenth century, book classification was a controversial subject, and all librarians were eager to learn about and to compare new systems for arranging knowledge. At the first conference of librarians held in this country in 1853, classification was one of the topics discussed. Charles B. Norton read to the group a letter from Romain Merlin in which he gave the principal points of his book classification. At the organizational meeting of the American Library Association in 1876, classification again was one of the topics discussed. Melvil Dewey's new *Decimal Classification* had just been published, and Mr. Dewey appeared before the group to describe and to promote his scheme. By the early twentieth century, however, the *Decimal Classification* had gained such wide acceptance that book classification was no longer controversial, and librarians at large turned their interests and their energies to what they considered to be unsolved, challenging problems. Classification was left to the classifiers. The appearance of the fifteenth, or standard, edition of the *Decimal Classification* was the occasion of some general revival of interest in classification, but for some four decades we have more or less accepted the *Decimal Classification,* without giving much thought to its qualities, good or bad.

It is easy simply to dismiss the *Decimal Classification* with the observation that it has endured, not because of any qualities it may possess, but because it is the scheme that is familiar to librarians and library users and because most libraries could not afford to reclassify, even though they might like to do so.

Its familiarity is unquestionable. Dewey taught his scheme at the New York State Library School, and the graduates of that school went forth to teach it in other library schools or to adopt it for their libraries. Today the *Decimal Classification* is the basic scheme taught in the beginning cataloguing course of every library school in the country, and 85% of college and university libraries and 98% of public libraries in the United States use the scheme in whole or in part.

To dismiss the *Decimal Classification* as something we must accept simply because it has monopolized the field of book classification does not do justice to the scheme. It is not merely something we must endure; it has enduring qualities. Miss Eaton's survey of classification

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in college, university and public libraries made in 1954 bears out this statement. One of the questions she asked college and university libraries was: Would you prefer some scheme other than the one you now use if it were possible to make a change? Eighty per cent of the libraries using *Decimal Classification* would not change even if they could. And 13% of those using other classification schemes would prefer to return to the *Decimal Classification*. The public libraries were not asked whether they would change their classification schemes if they could, but they were asked whether or not they had reclassified. Only 28 libraries reported a change from one scheme to another, although undoubtedly more than that have reclassified at some time. What reclassification has taken place in public libraries has been almost exclusively to the *Decimal Classification*. In the light of this evidence, it is obvious that many libraries are content with the *Decimal Classification* and that the scheme is likely to endure for some time to come. It is my purpose to analyze the scheme for those qualities which have made it endure. My approach will be positive. By this I mean that I will be looking for qualities that the Decimal Classification has endured because of—not in spite of. In so doing I make only a small claim for originality. I will quote several writers on classification, but sometimes when I am not quoting my remarks will undoubtedly have a familiar ring. When this happens, you may be hearing the rephrased remarks of Berwick Sayers, Ernest Cushing Richardson, Henry Evelyn Bliss, your library school cataloguing teacher—or Melvil Dewey himself.

The *Decimal Classification* has endured, first of all, because it presents a usable outline of knowledge, arranged according to recognizable principles.

Every book classification begins—or at least it should begin—with an outline of knowledge. When the *Decimal Classification* first appeared, it was not on his outline of knowledge that Dewey placed his emphasis; he appeared to be more interested in his notation and in his index than in the order of his classes. This is only reasonable. There had been many outlines of knowledge before his; neither was his the first book classification. The distinction of his scheme lay in the notation and in the relative index, and these were the features he publicized. Moreover, Dewey was first and foremost a practical man. He wanted a scheme that would work, one that would remedy the lack of efficiency and the waste of time and money in the constant recataloguing and reclassifying made necessary by the fixed system of arranging books. Any one of many systematic orders of knowledge might have served him, but it was his ingenious notation which served as the means of arranging books on library shelves.

But while notation and index are important to book classification, a usable outline of knowledge is essential. The best ordered book classification will not survive if it is burdened with a cumbersome notation and if its schedules are inadequately indexed. It is equally true that the best notation and index in the world cannot save a poorly ordered book classification.

The *Decimal Classification* has been severely criticized because of the order of its classes. There is no likelihood whatsoever that a modern classifier would arrange knowledge in the same order as Dewey. On the other hand, Dewey's outline of knowledge must be reasonably sound, or else it would not have endured.

Part of the criticism of the order of the *Decimal Classification* stems, I believe, from failure to understand the basis of the scheme. The order of the classes cannot be explained entirely on the basis of what Bliss calls contemporary scientific and educational concensus, as we are likely to try to do. Many of the expansions of the scheme which have come with the advancement of human knowledge are so ordered, but the skeletal framework of the scheme has a philosophical base.

Dewey always disclaimed his debt to any particular classification scheme for the order of his classes, although he did at one time admit that the outline of Natale Battezzati, which was an adaptation of the Brunet or French booksellers' system, stimulated him more than any other. Be that as it may, his scheme is not as similar to Battezzati and Brunet as it is to Francis Bacon's chart of human learning.

That the *Decimal Classification* is related to Bacon's philosophical system is, of course, common knowledge. Henry Evelyn Bliss in *The Organization of Knowledge in Libraries*, for example, calls attention to the similarity but considers it needless to discuss the resemblance or trace it in detail. His purpose, however, was different from mine. He set out to disqualify both the *Decimal Classification,* and Bacon's philosophical system along with it, as organizations of knowledge. My purpose is to explain the order of the *Decimal Classification,* and since the order can sometimes be understood only by looking to the ancestry of the scheme, I will pursue the relationship of the Dewey and Bacon systems in some detail, although by no means exhaustively.

Bacon's chart of human learning formed the framework of his treatise on *The Advancement of Learning*, which was published in 1605. His purpose in writing this treatise was ''to circumnavigate the small globe of the intellectual world to find what parts thereof lay fresh and waste, and not improved by the industry of man''—in other words, to survey what had been accomplished in the field of learning up to the turn of the seventeenth century and thereby to determine what remained to be accomplished. In breaking up the intellectual world into its various segments, Bacon follows a definite principle of division. He says:

The best division of human learning is that derived from the three faculties of the rational soul, which is the seat of learning. History has reference to the Memory, poesy to the Imagination, and philosophy to Reason.

The sense, which is the door of the intellect, is affected by individuals only. The images of those individuals—that is, the

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impressions which they make on the senses—fix themselves in the memory, and pass into it in the first instance entire as it were, just as they come. These the human mind proceeds to review and ruminate; and thereupon either simply rehearses them, or makes fanciful imitations of them, or analyses and classifies them. Wherefore from these three fountains, Memory, Imagination, and Reason, flow these three emanations, History, Poesy, and Philosophy; and there can be no others. For I consider history and experience to be the same thing, as also philosophy and the sciences.[1]

Invert Bacon's three main classes, and you have the order of Dewey's main classes: philosophy, religion, social science, philology, pure science, applied science, and the fine arts, the products of reason; literature, the product of the imagination; and history, the product of memory.

Memory produces history, and history Bacon divides into natural, civil, ecclesiastical, and literary. Civil history is of three kinds: memorials, antiquities, and perfect histories. Memorials are history unfinished, or the rough drafts of history; they merely record the observation of bare events, without cognizance of why these events took place or what their consequences might be. Antiquities are remnants of history which have escaped the shipwrecks of time. Perfect histories take the form of chronicles, lives, and narrations, which is another way of saying that they are either histories of the times, of persons, or of actions greater in scope, depth and significance than memorials.

Dewy's history class is quite similar to Bacon's civil history. Bacon considered natural history to be the basis of the sciences, in that it recorded the variety of things and led to new discoveries, and Dewey moves natural history to the sciences. Ecclesiastical history Dewey classes with religion and literary history with literature. But civil history remains much as Bacon arranged it. Dewey's description and travel, antiquities, biography, and history of specific places closely parallel the memorials, antiquities and perfect histories of Bacon.

Next in Bacon's system comes imagination, which produces what he calls poesy and what we today call belles lettres in all forms. Poesy, as Bacon put it, "exceeds the measure of nature, joining at pleasure things which in nature would never have come together, and introducing things which in nature would never have come to pass." In Bacon's scheme, philology, rhetoric, and elocution have no place in poesy, because they emanate from reason, not from imagination. In inverted fashion, Dewey's literature class precedes, rather than follows, his history class. Like Bacon, he separates philology and literature, but he does make the concession of linking rhetoric and locution to literature.

Finally in Bacon's system comes reason, which produces what he

calls philosophy, but which encompasses the subjects which we today would designate as philosophy, religion, philology, fine arts, and the sciences: physical, natural, and social.

Bacon divides philosophy into three parts: divine, natural, and human. Divine philosophy, which leads off the class, is concerned with the discovery of God through the mind, as distinct from revelation. Natural philosophy is concerned with physics, the investigation of variable causes; applied science; and metaphysics, the investigation of final causes. Human philosophy is concerned with the philosophy of humanity, or man segregate, and civil philosophy, or man congregate.

The influence of Bacon's philosophy division is felt throughout several classes of Dewey. For instance, Bacon divides his philosophy of humanity into body and mind, and three of his "body sciences"—decorative, athletic, and voluptuary arts—constitute Dewey's fine arts division. Bacon divides the science of the mind into substance and faculty, and this order pervades Dewey's philosophy class, which moves from substance or nature of the mind to the faculties of the mind to the exercise of these faculties. Bacon's philosophy of man congregate moves from conversation, which includes etiquette and manners, to business, to state government, economics and law. In inverted fashion, Dewey's social sciences move from political science to economics to law and end with customs and folklore, which includes etiquette and manners.

The *Decimal Classification,* then, has a philosophical base which affects its fundamental structure. But Bacon only breaks up knowledge into rather large chunks. He does not provide us with the many little slivers which are necessary to a book classification. Dewey, therefore, had to ramify Bacon's classes. The order he follows in these ramifications may be logical, as in geology; geometrical, as in history and in the numerous subjects which may be subdivided geographically; chronological, as in the time divisions of history and literature; genetic, as in the natural sciences; or alphabetic when he lacked any other special order. His primary goal—one he does not always achieve—seems to have been a natural progression. Berwick Sayers states this purpose of classification very clearly in his *Manual of Classification.* He writes:

He [the student] may find that most of the book classifiers have been working . . . . towards the position as stated by Bliss when he says of science order: 'One study may be applied to, or introductory to, another, as mathematics to physics, physics to chemistry, chemistry to biology, biology to society, sociology to economics, linguistics to literature, and logic to philosophy'; and so a logical order of main classes emerges on a characteristic of progression from one science to another.[2]

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This characteristic of progression may apply not only to main classes, of course, but to sub-classes as well. The greatest exponent of this natural progression characteristic was Charles Ammi Cutter, but Dewey also made use of it. Take for example Dewey's treatment of political science.

Political science, as Dewey uses the term, may be defined as "the science which is concerned with the State, which endeavors to understand and comprehend the state in its conditions, in its essential nature, in its various forms or manifestations, its development." This is a nineteenth century definition, coming from J. K. Bluntschli's *The Theory of the State*. This is not to say that the same definition may not be found in a modern treatise on political science. It just so happens that the nineteenth century definition fits.

One more definition is necessary before Dewey's political science scheme is analyzed, and that is a definition of state. Almost all definitions of state include four elements: people, territory, organization, and sovereignty. The following definition is representative and widely accepted:

> The state, as a concept of political science and public law, is a community of persons more or less numerous, permanently occupying a definite portion of territory, independent or nearly so, of external control, and possessing an organized government to which the great body of inhabitants renders habitual obedience.[3]

Dewey's political science is made of these four elements essential to a state: people, territory, organization, and sovereignty. These elements are treated historically and descriptively, subjectively and objectively.

Dewey's divisions of political science (320) are these:

321 - Forms of state
322 - State and church
323 - Relations of state to individuals or groups
324 - Suffrage and elections
325 - Migration and colonization
326 - Slavery
327 - Foreign relations
328 - Legislation
329 - United States political parties

From this bare outline, Dewey's order is not apparent. The classes do, however, have a systematic arrangement. We begin with political theory. All early social organizations arose spontaneously and for a long time grew without conscious direction. Later a point was reached when man, realizing what was taking place, began to modify his institutions. As a result he was led to examine their nature and to attempt an explanation of their phenomena.

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There are two phases, therefore, in the evolution of the state. One is the objective, concrete development of states as manifested in their governments and external dealings; the other is the subjective development of ideas as to the state in general. Dewey begins with the theory of the state (320.1) and then proceeds to the form of the state (321), which is the outward manifestation of the state's existence. The form of the state he approaches in two ways: (1) a classification based on the location of sovereignty in government and (2) a classification based on the evolution of the state, from its origin in the patriarchal family to the development of the republic.

Standing before the relationships of the state to individuals and groups is the relationship of the state to a rival institution: the church (322).

The analysis of the state leads naturally to a consideration of sovereignty. Viewed from its internal aspect, it opens up the relations of the state to its population; viewed from its external aspect, it leads to the relations of state to state.

Population is made up of man congregate and man segregate; that is, of groups and individuals. The obligations between the state and its population are reciprocal; that is, the people confer authority and power upon the state and hence they owe the state obedience. On the other hand, there are restrictions on how far the state may go in regulating the actions of those who owe it obedience; individuals and groups enjoy rights and privileges which the state may not invade. Dewey considers first the relations of the state to groups whose social, economic, or other cultural ties create political problems (323.1-.3). Then he considers individual rights and protections (323.4).

But the state does not guarantee rights and protection to anyone who happens to reside within its territory. It is citizenship which makes the individual a member of a political society, subject to its government, and bound to its fortunes. It is the citizens, too, who, by direct act or tacit consent, confer power and authority upon the state. However, the entire citizenship does not have the right to share in expressing the state's will. Only the electorate shares this right. Dewey proceeds naturally, then, from group and individual rights (323.4), to citizenship (323.6), and to suffrage and elections (324).

The population of a state does not remain static. Movements of people, or migrations, exert a powerful influence on the internal political life of a state. And if migration is in the form of a conquest, the opening up of new lands creates colonies and colonial government. Colonization may, of course, be considered a form of organization, but Dewey links it with population instead. His progression is from movements of population (325.1-.2) to the result of these movements: colonization (325.3).

Next slavery (326) occupies a singular position in the Dewey scheme. Slaves are ordinarily displaced people and therefore slavery is connected with movements of population. Slaves constitute a social

group; yet they differ from the groups previously considered by Dewey in that they have no rights or liberties which they can assert against the state. Slavery, then, culminates the analysis of the state's population.

Having considered the internal aspects of sovereignty, Dewey turns next to the external aspects, to the relations of state to state (327). Foreign relations, as Dewey uses the term, means the negotiations between states for the purpose of protecting or furthering their vital interests. The law governing these relations is excluded.

Dewey turns from sovereignty to the organization of political machinery. The relations of the state to groups, individuals, and other states lead to the process which regulates these relations: legislation (328). But while the legislative process has its basis in law, there is an extra-legal piece of political machinery which exerts a powerful influence on the state's relations, both foreign and domestic. This is the political party—the vital force which keeps the machinery of the state in operation (329).

Dewey, then, is not merely a tabulation of classes. He proceeds upon definite principles of division that we can recognize even if we do not, in the light of modern knowledge, always appreciate them. Henry Evelyn Bliss has been very blunt in his criticism of Dewey. In *The Organization of Knowledge in Libraries* he attacks the scheme on every possible score and concludes:

> The Decimal Classification is disqualified as an organization of knowledge both structurally and functionally. It does not embody the natural, scientific, logical, and educational orders. It fails to apply consistently the fundamental principles of classification . . . . It is an antiquated and inadaptable product based on the plan of an undergraduate of six decades ago and never coherent or scientific or practical.[4]

Much of Mr. Bliss' criticism was directed at the first and second summaries of Dewey. The lack of proper order of these first hundred divisions are objectionable on theoretical grounds, but in practice the order of these divisions seems to be of little consequence to libraries. The order of the main classes means little as far as the arrangement of the book collection is concerned, because libraries arrange the main classes to suit themselves. The arrangement of the second summary is of little consequence because the library user probably is working within a narrower field than the second summary provides and therefore does not proceed, let us say, from economics to transportation, or from North American to South American history.

Even Mr. Bliss concedes that the expansions of Dewey, which come after the third summary, are an improvement upon the fundamental structure. He writes:

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His [Dewey's] classification has embodied a large amount of scientific detail, much of which, obtained from specialists or 'experts,' is scientifically correct. Otherwise it would have attained to less acceptance by scientists . . . . *Subordination* and *collocation* are manifest in most of these 'expansions,' but those principles were disregarded in the original, fundamental structure.[5]

So much for Dewey's outline of knowledge and principles of division.
The *Decimal Classification* has also endured because its editors have been liberal in their policy of expanding old topics and inserting new ones, but at the same time conservative in their rearrangement of topics.

No matter how comprehensive a classification scheme is in the beginning, it eventually needs revision. The author of a classification scheme cannot see far beyond the present boundaries of knowledge, and so his scheme should be expansive and flexible in plan.

The *Decimal Classification* has had some measure of success in keeping pace with knowledge by means of revised editions and by means of quarterly supplements to the latest (16th) edition. It meets the criterion of expansiveness, in the sense that it readily admits new subjects or ramifications of old ones. But it is flexible—that is, capable of admitting new topics and concepts without dislocation—only to the extent that any enumerative scheme is flexible. The problem of relocation was concisely stated by the Dewey Classification Editorial Policy Committee in 1956, as follows:

In the making and editing of any classification, two basic principles are constantly in conflict. One is the DC traditional policy of integrity of numbers, which enables its users to depend on each new edition to include few or no relocations of topics but to include expansions which are based on the schedules in earlier editions, thereby achieving continuity and avoiding the cost of reclassification. The other principle is the philosophy of keeping pace with knowledge, which holds that any classification scheme, to retain its usefulness must, from time to time, restate or redefine and regroup or rearrange subjects according to the changed concepts of a new generation.[6]

With the exception of the 15th edition, the *Decimal Classification* has been revised in keeping with the Committee's first principle, that of integrity of numbers. Revisions have been in the form of additions and expansions rather than in alteration of the scheme. Therefore, although in one sense the *Decimal Classification* is expansive, in another sense it is rigid. The balance which the editorial policy has maintained between expansiveness and rigidity is one of the reasons why the *Decimal Classification* has endured.

The most significant contribution which Dewey made to

classification was his decimal concept. Not only has this quality contributed to the endurance of the *Decimal Classification;* it has also contributed to the endurance of every classification scheme which has embodied it. Of this method of subordination, Dewey's biographer, Fremont Rider, has this to say:

Just what is the essential quality of the Decimal Classification that has made it so great a contribution to librarianship? To answer this question it is necessary to distinguish carefully between the underlying and the superficial; to realize that the *Dewey Decimal Classification,* despite its present very widespread use, is, in the long view, a thing of evanescent value; to see that it was Dewey's basic classificational concept, and not the details of the schedules in which he embodied that concept, persuasively ingenious and convincingly logical though these schedules were, that was his great contribution.

What is this basic and revolutionary concept? He implied it clearly in his 'memo' to the Amherst faculty—a progressively, and indefinitely more minute, classificational subordination expressed by means of decimally placed nomenclative characters. How revolutionary this concept was is the more apparent if we attach to 'decimally,' as we have used the word, an acquired meaning broader than its dictionary one, making it inclusive of all numerical bases instead of merely the ten-digit one.[7]

So far I have refrained from mentioning the Library of Congress classification scheme, but now I must use it as an example. In contrast with the *Decimal Classification,* the Library of Congress scheme uses what Fremont Rider calls a serial nomenclature; general numbers are not provided, only specific ones. The Library of Congress scheme, then, admirably serves those libraries whose collections approach the scope and depth of the Library of Congress, but it is not adaptable to the needs of libraries of a different nature. The following comparison of Dewey and Library of Congress classification illustrates this point. Suppose a library acquires these five books on physical geography:

The Principles of Physical Geography
Physical Geography
Practical and Experimental Geography
Introduction to Physical Geography
About this Earth; and Introduction to the Science of Geography

These examples were all taken from the *Library of Congress Catalog: Books - Subjects,* and, as their titles indicate, they all deal with physical geography in general terms. According to the Decimal Classification, they could be classed 500, or 550, but most likely they would all be classified 551. Classified according to the Library of Congress scheme, each of the five books would necessarily have a

different classification number. All are general works on physical geography published in the twentieth century. *The Principles of Physical Geography* is a comprehensive work and classifies in GB53. *Physical Geography* is a compend, and therefore goes in GB54. *Practical and Experimental Geography* is a textbook and goes in BG55. *Introduction to Physical Geography* is also a textbook, but it is a quarto volume and therefore goes in GB56. And *About this Earth* is a popular work and goes in GB59. There is no general number in the Library of Congress schedule to hold them all together; because they differ in scope, form, size, and treatment, each must have a different classification number.

It is the decimal concept, lacking in the Library of Congress scheme, which makes the *Decimal Classification* adaptable to the needs of all sizes and types of libraries, because this concept enables a library to use broad or close classification, according to its needs. A library may use only the ten main classes, all 17,928 classes which the 16th edition provides, or any number of classes between these two extremes.

Another quality which has contributed to the widespread acceptance of the *Decimal Classification* is its pure notation of arabic numerals. The use of arabic numerals has not, of course, contributed to its acceptance in the United States as much as it has in foreign countries.

It is only fair to point out that Dewey's base of ten arabic numerals is too narrow to permit economical notation. Had he applied the decimal concept in a broader sense and made the letters of the alphabet his base, a shorter notation would have been possible. Cutter, for example, used a mixed notation for his *Expansive Classification* and used as his base the letters of the alphabet. A comparison of the divisions provided by notational symbols in the two classification schemes shows:

	Expansive	Decimal
One symbol	26	0
Two symbols	676	0^8
Three symbols	17,576	1,000
Four symbols	456,976	10,000
Five symbols	11,881,176	100,000

Dewey wanted a pure notation, however, even at the sacrifice of a short one, and it is undoubtedly due to this quality that the *Decimal Classification's* notation has become a sort of international language.

Three more qualities which have caused Dewey's scheme to endure will not be pursued at length. These are its terminology, its index, and its mnemonic features.

A classification scheme is nothing more than a statement of knowledge in words. Classification therefore is inextricably linked with semantics. Dewey had a life-long interest in words, both in their

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meaning and in their spelling. The precise terminology used to express his scheme—with the exception of the 15th edition—undoubtedly contributed to the scheme's acceptance.

Dewey placed great importance on his index; so emphatic was he on this point that he leads one to believe that he considered the index more important than the order of his classes. One of the canons of classification is that an index to the schedules be provided, and all usable schemes have them. Dewey's index is essential, but it is not a substitute for a systematic order of classes.

The mnemonic features which pervade the scheme have proved to be useful.

Now I am going to digress briefly from my topic. I have been discussing the qualities of the *Decimal Classification* which have been responsible for its endurance. There are two reasons for the endurance of the *Decimal Classification* which have nothing to do with the qualities inherent in the scheme. They are Melvil Dewey the man and the measures he took to assure the continuation of the scheme.

Dewey conceived his classification scheme in 1873, when he was 21 and a junior at Amherst College. His public school education had been haphazard. The school terms at Adams Center, New York, were short and change in the teaching staff was frequent. He read everything he could lay his hands on, but then what could one lay his hands on in a rural New York community in the mid-nineteenth century? How could a man with this educational background devise a classification scheme which has received such universal acceptance? To answer this question, one must reckon with Dewey's personal qualities. He had an encyclopedic mind and an abundance of intellectual curiosity. He was an organizational genius. And, with the help of a forceful personality, he was his scheme's best promoter.

A classification scheme needs constant study and revision if it is to keep abreast of knowledge and survive. Mr. Dewey, through the Lake Placid Club Education Foundation, provided the funds for the work of revision, and placed the *Decimal Classification* on sound financial footing. The Foundation, in turn, placed the scheme on sound professional footing in 1937, when it decided to share the control of the *Decimal Classification* with the library profession and appointed a permanent *Decimal Classification* Editorial Policy Committee, made up of members of the Foundation and members appointed by the American Library Association.

In summary and conclusion, I quote Berwick Sayers from his *Manual on Classification:*

No one now rushes to defend the D.C. on the grounds of the modernity of its order or the brevity of its notation. The curious fact remains that more and more libraries throughout the world continue to use it, many of them modifying it; somehow it works. We should fail in our appreciation of services rendered if we did not say that a scheme which has survived for eighty years in

ever-growing currency in spite of merited criticism must have virtues which in practice outweigh our theoretical objections. These are its accessibility and the ease with which it may be applied in whole or in part to collections of books and other material of any size, and expanded as these collections grow. Even if the order of the main classes and of some divisions is unacceptable to many minds, there is in ordinary general library practice no obvious necessity for an optimum order, although such an order is in some way necessary to the ideal scheme, which should be one of logical classes in logical relations. Unfortunately all order is conditioned when applied to books, by the size of the books, the physical shape and division of a library into departments and branches, which make it impossible to run all books in one sequence of class-numbers whatever they may be.

After a lifelong use of the Decimal scheme, in which I have read and listened to thousands of comments, I am convinced that the oldest and most persistent one comes from the expert who wants all material together on his subject, whatever its verifiable place; it is the most understandable one and the least reasonable. The notation was and remains the most obvious reason for the world-wide use it enjoys; that is, an international 'language' understood by all nations. Some day the Decimal scheme may disappear, as do all human efforts, but now we look forward to the seventeenth edition.[9]

Notes

1. Francis Bacon. *The Works of Francis Bacon,* ed. James Spedding, Robert Leslie Ellis, and Douglas Denon Heath (Boston: Taggard and Thompson, 1863), Vol. VIII, pp. 407-408.

2. W. C. Berwick Sayers, *A Manual of Classification for Librarians and Booksellers* (3d ed., rev.; London: Grafton & Co., 1959), p. 88.

3. J. W. Garner, *Political Science and Government* (New York: American Book Co., 1928), p. 52.

4. Henry Evelyn Bliss, *The Organization of Knowledge in Libraries* (2d ed., rev.; New York: The H. W. Wilson Co., 1939), pp. 227-229.

5. *Ibid.,* pp. 201-202.

6. "Criteria and General Procedures for Decimal Classification, Edition 16. Restatement, December 5, 1955," *Journal of Cataloging and Classification,* XII (April, 1956), 91-92.

7. Fremont Rider, *Melvil Dewey* (Chicago: American Library Association, 1944), p. 37.

8. It should be noted that the *Universal Decimal Classification* which dispenses with the final zeros has ten one-symbol forms and 100 two symbol forms.

9. Sayers, *op. cit.*, pp. 125-126. In the last sentence the word "seventeenth" has been substituted for the words "necessary sixteenth" to update Sayers' statement.

Library of Congress
Classification for the
Academic Library

Irene M. Doyle
Assistant Librarian, University of Wisconsin

Gabriel Naudé, as early as 1627, advised on the arrangement of books in a library as follows:

> The seventh point . . . . is that of the *Order* and *Disposition* which Books ought to observe in a *Library;* . . . . for without this, doubtless, all inquiring is to no purpose, and our labour fruitless; seeing Books are for no other reason laid and reserved in this place, but that they may be serviceable upon such occasions as present themselves; Which thing it is notwithstanding impossible to effect, unless they be ranged, and disposed according to the variety of their subjects, or in such other sort, as that they may easily be found, as soon as named. I affirm, moreover, that without this Order and disposition, be the collection of Books whatever, were it of fifty thousand volumes, it would no more merit the name of a *Library,* than an assembly of thirty thousand men the name of an *Army,* unlesse they be martially in their several quarters, under the conduct of their Chiefs and Captains; or a vast heap of stones and materials, that of a *Palace* or a house, till they be placed and put together according to rule, to make a perfect and accomplished structure.[1]

Three hundred years later classification of books is still a live subject, and largely for the same reason: "that they [the books] may be serviceable upon such occasions as present themselves".

Though it is a live subject, and one of the most powerful tools in libraries, it is surprising how little seems to have been published—considering its long history—on book classification, how little has been published on the Library of Congress classification, how very little on L.C. classification in the academic library, and how very, very little on "L.C. Classification in the Modern Academic Library."

I like to believe that the Library of Congress classification had its beginning at the University of Wisconsin. Mr. J.C.M. Hanson, cataloguer at the University of Wisconsin 1893-1897, reported on its beginning as follows:

During several informal discussions on classification and nota-
tion which I had about 1896 with Miss Olive Jones, librarian of
Ohio State University Library, the defects of both the D.C. and
the E.C. were gone over quite thoroly. We were both agreed
that a new classification with a notation representing a compro-
mise between the two would be desirable, especially for colleges
and university libraries. As for notation, we had in mind one or
two letters to indicate classes, subdivisions to be indicated by
numerals, either in regular or decimal sequence.

In 1897, therefore, when confronted by the necessity of sub-
mitting plans for a classification for the Library of Congress,
the rough sketches drawn up in 1895-1896 were again brought
out and expanded. Fortunately, the Library of Congress had
secured, about this time, the services of Charles Martel, the
present chief of the Catalog Division. Mr. Martel was in sym-
pathy with the simplified notation suggested and the main work
of developing both notation and schedules was assigned to him.
It is mainly due to his indefatigable zeal and interest that the
classification developed as it did during the next fifteen years.[2]

After leaving the Library of Congress, Mr. Hanson, at the Univer-
sity of Chicago, worked with the L.C. classification for many years.
Based on this additional experience with it, he wrote, "The advan-
tages have seemed to outweigh the disadvantages to such an extent
that personally I have no hesitation in recommending the adoption of
the L.C. classification for college libraries, large and small, as
against any other system in the field."[3]

We now have L.C. classification at the University of Wisconsin.
Our own experience in changing to it is so recent, and it has been
such an absorbing experience, that perhaps I have failed to see the
woods for the trees in including in this paper such a full report of a
single institution. It may seem from these opening remarks that the
title of this paper should be: "The Library of Congress Classifica-
tion in *One* Academic Library."

In 1953, when classification became a very important topic with
most of us in the University of Wisconsin Library, we had just moved
from very crowded quarters in a building which we shared with the
State Historical Society to a new University Library building. Cata-
loguing was being done centrally for eleven department and school
libraries on the campus and for several reference collections within
the new library as well as for the general collection. There were in
the new building ten floors of stacks and, in the basement, stacks
providing compact storage for half a million books. The libraries
contained about 800,000 accessioned volumes, of which 50,000 were
uncatalogued. The cataloguing staff had not increased with the book
budget and preparations for moving to the new library (including a
series of projects which required almost the entire time of most of

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the cataloguers and many of the clerical staff) had taken priority over regular cataloguing—hence the backlog. The 50,000 uncatalogued books were not unavailable, however, for a multiple slip system was used so that on the day a book reached the Catalog Department a card was placed in the Public Catalog supplement and the book was passed on to the Circulation Department. The volumes could circulate, and indeed a great many of them did circulate.

For some time we had wanted to change to a different classification system. Wisconsin was using the Cutter *Expansive Classification.* In 1893 Cutter's system was chosen over Dewey's because the notation was more elastic and it seemed likely that Cutter's seventh classification, then in the making, would profit from some of the errors of Dewey, and that it would be more modern and more scientifically developed. At the time the Cutter Expansive system was chosen for Wisconsin, the first six classifications for small and medium libraries were printed with an index covering all six classifications. The seventh, planned for the large library, was not yet finished. Unfortunately for Wisconsin it was never finished, and the Cutter *Expansive Classification,* which continued to be used until 1954, was a combination of the 6th, with the index to the first six classifications, and part of the 7th with an index to each class used. Some classes of the 7th were printed too late for Wisconsin to adopt, or so it seemed to the cataloguers, since they had already expanded parts of the 6th. Miss Eliza Lamb, who worked with Mr. Hanson at Chicago and became head of the Catalog Department at Wisconsin in 1930, described the work of expanding the 6th classification as follows:

> The librarian usually made an outline based on the best available authorities. This was referred to an expert in the field, generally a member of the faculty. The results have not always been continuously pleasing, even to those responsible. Such was the case for the Botany scheme which was criticized adversely by the very professor who had worked it out, he having forgotten his connection with it.[4]

Mr. Hanson remained at Wisconsin four years only, but within that period he discovered that the classification was far from perfect:

> Four years with the Expansive Classification convinced me that no mistake had been made by the University of Wisconsin in selecting the Expansive in preference to the D.C. classification. However, the irregular sequence of letters, the preliminary numbers for form classes, and other features, combined with the slow progress in furnishing additional schedules, proved a serious disadvantage.[5]

Forty years after Cutter classification was adopted at Wisconsin, Miss Lamb published an explanation and a defense of it:

The Expansive notation has been criticized as cumbersome, but there has been little if any trouble . . . . Although the younger generation has the reputation of being unfamiliar with the alphabetical sequence, books are both found and shelved with ease . . . . [It] has proved adequate to the required amplification of passing years, avoiding the labor and expense of reclassification which has been found necessary for many libraries adopting other classifications before that of the Library of Congress was available.[6]

But twenty years later, in 1953, the number of volumes catalogued per year had trebled, the staff had increased considerably, the revising time required taxed the abilities of the staff. There was little time for the research, study, contemplation, and experimentation necessary for the expansion of many of the classes, the placing of new subjects, and the new approaches to old subjects. There was little time for the instruction needed for the new and inexperienced cataloguers. For the most part they had not heard of the Cutter *Expansive Classification*. To most of them "Cutter" meant only "Cutter author tables." There were many inconveniences—for example we had only three copies of the classification. We spent years trying to locate copies of the 6th and 7th classifications, finally finding someone who had a small stock for sale. Negotiations were quickly underway but when the signatures were received and checked against our copies we could use less than one-fourth of the pages. The rest of it had to be typed, the equivalent of two rather large volumes.

Not only in the Catalog Department but throughout the library there was dissatisfaction with Cutter, particularly among the new staff members. Faculty members who had studied in other research libraries had become familiar with and recognized the merits of the Library of Congress classification. New faculty members were completely unfamiliar with Cutter. When at last we were settled in our new building, it seemed a propitious time to change from Cutter, particularly with 50,000 volumes awaiting cataloguing. We were not only willing, but in fact eager, to give up Cutter in spite of its good, enduring qualities.

There was one factor which deterred us from deciding immediately in favor of the Library of Congress classification: the notation. Both Cutter and L.C. consist of combinations of letters and figures. What confusion there would be if the classification could not be recognized as one or the other! Cutter class numbers, as assigned at the University of Wisconsin, consist of a combination of from one to five letters. Wherever there is a geographical division, the letters are followed by figures (used decimally). L.C. class numbers consist of one or two letters only, followed by figures 1 to 9999 (used as integers). In practice, with no exceptions, Cutter class numbers had been written as one line (both letters and figures) *except* when there were more than four letters. Only then were figures which followed the letters

written on a second line.[7]   L.C. class numbers would not have more than four letters—in fact, not more than two. The figures which follow the letters could always be written on the second line. Thus the problem was resolved very easily! Sufficient differentiation was provided to guard against confusion. To forestall any misunderstanding that might possibly occur, and to help the Circulation Department, we planned to stamp every University card, which included a Cutter call number, with the word "Cutter" below the call number.

The second problem which we had to consider was: Assuming that L.C. classification is the best existing classification for this library, is it enough better than Cutter for us to give up Cutter for it? The weaknesses and advantages of Cutter were well known to all of us. The literature for L.C. classification was examined for criticisms and reports of experience of other libraries. The familiar arguments in its favor, occurring over and over again in the literature, are, in part, as follows:

Comprehensiveness
Particularity (topics are logical subdivisions of general subjects)
Expansiveness
Flexibility
Practicality
Simplicity of notation
Individuality (made for L.C., for an actual collection of books, a very large collection)
Adaptability

Each main schedule is preceded by a synopsis
There are tables which permit of very precise classifying, particularly the "floating" geographical tables in Class H
There is an index to each schedule
Classifiers who made the classification and who revise it are competent classifiers
It is a "close" classification

Since Library of Congress is behind it, there is reasonable assurance that it will be kept up to date; also that the schedules, printed as government documents, will be reasonably priced
It undergoes continuous amplification in those fields in which there is a concentration of material
Printed schedules are reprinted with additions and changes added
Printed schedules are revised
Additions and changes are distributed quarterly

Class numbers are printed on L.C. cards in the majority of cases

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Notation is elastic

Each class is printed as a separate book, Language and Litera-
ture (Class P) in several volumes

L.C. list of subject headings can be used as an index, in lieu of
an index

Not many *general* adverse criticisms were found. As Palmer has
said "The Library of Congress classification has been approached
with a certain measure of restraint."[8]   Typical of the unfavorable
comments found are those from Mann:

No directions for its use
As yet, no complete index
Lack of mnemonic features
The magnitude of the scheme[9]

and from Bliss:

Order of main classes unscientific and unecomonic
Five letters unused, but many important subjects without dis-
tinctive literal notation
Notation is of excessive length, in many cases far beyond the
economic limit
Too complicated and cumbersome[10]

Ranganathan, also, supplied an adverse criticism of L.C. In com-
menting on rigidity in the notation of some classifications, he said that
this rigidity can be broken by numbering the known specific subjects
by integers that are not consecutive, leaving unused integers between
them—a "gap-notation." But the difficulty is that while some gaps
remain, others get filled up and it is in these filled-up gaps that more
and more new specific subjects must be inserted. He commended
Melvil Dewey for breaking this rigidity in gap-notation by using a
"pure decimal-fraction-notation," and continued:

It is a great pity that this master-stroke was lightheartedly ig-
nored and the rigid, primitive, gap-notation of integers was
adopted by the most influential scheme of classification in ex-
istence - the Library of Congress classification - which has all
the influence, resources, and backing of a mighty government.
The world is all the poorer for this.[11]

Much earlier Hanson wrote as follows on this same matter of in-
tegers versus decimals in the L.C. notation:

Mr. Spofford, Librarian of Congress since the early sixties, and
assistant librarian after 1897, had personally supervised the de-
velopment of the Jeffersonian Classification, then in operation.
Mr. Spofford realized as fully as anyone the need of a new sys-
tem and was most generous and friendly in his attitude toward

our plans. Only on one point was he inexorable: there must be no decimals.

This was one of the reasons why decimals were not more freely used at the outset. Later on, while it would have been a relatively simple matter to convert the numbers for subdivision into decimals by writing them 0000-9999, the advantage of shorter numbers for many thousands of books was thought to be of greater importance than the slight gain in symmetry and regularity, resulting from the decimal arrangement. [12]

In connection with the Army Medical-Library of Congress discussions concerning a proposed Army Medical Classification, Taube, in 1950, made this comment concerning the weaknesses of L.C.:

Even within the structure of the Library of Congress itself, this conflict between general and special interests is a constant and recurring phenomenon. Special consultants in various fields have found that the library classification brought together unrelated materials and tore asunder materials which [naturally] belonged together. Much more serious is the feeling of some of the special divisions that the general cataloging and classification system neglects and subverts their special interests. Many of these divisions have set up special collections and special bibliographic keys not provided by the general bibliographic organization of the library. The degree of unification to be achieved in the Library of Congress is a matter of internal administrative policies, but the reality of the problem is additional evidence that the specialist is not content with the by-product of a universal organization . . . . What is required is the recognition that the Library of Congress system, for all its complexity and detail, is not a tool for specialists but a general system for the non-specialist's approach to knowledge as a whole. [13]

Finally, in our consideration of the L.C. classification, we had to ask ourselves, and answer, this question: "Does this classification effectively meet the demands of the University of Wisconsin library?"

In fields where the instruction offered includes doctoral programs, as in the arts, the collections have to be represented in considerable depth and necessitate large volume holdings. We convinced ourselves that the Library of Congress classification does provide a serviceable arrangement for books in these fields where research needs necessitate voluminous holdings. An examination of its quarterly "Additions and Changes" convinced us that an effort was being made to keep the classes represented in these disciplines up-to-date.

We made our decision in favor of changing to L.C. classification knowing full well that it would not be entirely satisfactory in all subjects, and that we were definitely influenced by the fact that we could

make certain advantageous applications of the system. Later we read in Shera and Egan's *The Classified Catalog:* "The first principle to be remembered in either choosing or constructing a classification is that there is no single universal system that will serve all purposes in all fields. The second principle is that there are no absolute values in classification other than those of utility in the particular situation."[14]

Various studies on Cutter versus L.C. classification, and on re-cataloguing and cataloguing costs, were made for our Library Committee, of which the Librarian was a member. The Committee decided against the proposal of the Library Administration to reclassify the books already classified in Cutter, a project with which we had hoped to combine some badly needed subject heading revision. It approved the proposal to classify all new accessions (i.e., all titles not previously catalogued) according to L.C. classification. The President of the University agreed with the Committee that changing over to the Library of Congress classification was desirable. Then, on May 3, 1954 the Committee brought a proposal to the University Faculty.

At Wisconsin, the University Faculty has a very important part in academic affairs. It "has charge of all matters which concern more than one college, school, or division, or are otherwise of general University interest. . . . Subject to the laws and by-laws of the Regents, under the laws of the State, the Faculty shall have general charge of those questions of scholarship which pertain to more than one college, school, or division; and they may make needful rules for the enforcement of scholarship and discipline . . . . In case of conflict of jurisdiction between University Faculty and the faculty of any college, school or division, the decision shall rest with the University faculty."[15] The Wisconsin Faculty is in charge of questions concerning the educational interests or educational policies of the University; requirements for admission to colleges, etc. and for graduation; recommendation of candidates for honorary degrees; regulation of social affairs and athletic sports; investigation of cases of alleged infraction of University rules; elections of Library, Nominations, University and other committees, as well as many other matters.

The proposal brought to the Faculty by the Library Committee follows:

> The University Library Committee and the librarians of the School and College libraries recommend that the Faculty approve the use of the Library of Congress classification system in lieu of the Cutter Classification for books in the University library system, except those in the Law Library.[16]

The Committee further called the Faculty's attention to several points:

1) Disadvantages of Cutter

2) Advantages of L.C. classification, especially the fact that "classification number and subject entries on the printed cards can be used almost automatically." Also that, in using the classification number on the L.C. card there would be in the U.W. library a saving of 42-cents per title in cataloguing costs.

3) Reclassification was not feasible because of the cost alone, the estimated cost being not less than half a million dollars.

4) Discontinuing the use of Cutter classification and adopting that of the Library of Congress meant that, with a few possible exceptions, most of the books classed in Cutter classification would never be reclassified, but would be shelved as far as possible on the same stack levels as the corresponding classes in the Library of Congress classification.

5) Periodicals would be taken out of Cutter classification and all periodicals shelved together alphabetically. Current serials, except periodicals, would be gradually reclassified into L.C.

6) Books in the reference rooms would be reclassified into L.C.

7) The saving in cost of cataloguing would enable the library to keep up-to-date in the cataloguing of new acquisitions and enable it to eliminate the 47,000-volume arrearage within 5 years.

The Faculty voted favorably on the adoption of the Library of Congress classification system.

For the next three months while most Catalog Department staff members were supervising some parts of the reclassifying of all periodicals in the stacks into one alphabetical group, or completing other projects, they were, in addition, studying the L.C. classification system since none of our cataloguers had had experience with it. We held a series of meetings with them in small groups for examination, explanation, and discussions of the schedules. Each cataloguer accumulated a file of L.C. proofslips in the class in which he was to work and studied the class numbers as assigned by the Library of Congress. In September 1954 we were ready to begin cataloguing again.

All book cataloguers but two were assigned to cataloguing the approximately 25,000 books for which L.C. cards with call numbers were on hand. Catalogued next were the some 6000 books for which there were L.C. cards without call numbers or with analytic call numbers. Finally, most of the cataloguers were transferred to original cataloguing, and the cataloguing of books with L.C. cards was continued by a very small staff. By this time, there had been built up a sizable shelf list which helped considerably in the classification of books without L.C. cards.

Since we planned from the first to take full advantage of the

classifying done by the Library of Congress, we accept the class numbers on the cards unless in the process of checking them with the schedules we find them in error, as an error in printing, or an earlier class number which L.C. has later revised or expanded. We have carried over from work with Cutter no notions which we may have had of the best placement of material (as subject bibliography which we had thought previously must be with the subject). We do not dwell on L.C. classification's weaknesses, which for our purposes are minor. We are thankful for its many good features.

Reclassification of reference collections will soon be completed. We do not worry about the number of books which will remain in Cutter. In the basement of our library are space and compact shelving for half a million volumes. Eventually, perhaps in 10 years or so, the "Cutter books" will be moved to the basement, except the "live" titles which may then be reclassified. Perhaps we can in the meantime reclassify each "Cutter book" that a borrower returns, but there is no plan for that at present. The 50,000-volume backlog has now (1959) been reduced to 11,000 volumes, a great part of which is in Hebrew, Russian, other non-roman alphabets and ideographic languages.

Five years ago we classified our first book by the Library of Congress system. Now, five years and 130,000 titles later, we may well ask: Should we have changed classification? Has the change to L.C. classification in our particular library been a satisfactory one? Since I did not think that my personal feeling in the matter would make for a sufficiently impersonal answer (and furthermore one should protect oneself against being accused of institutional chauvinism), I questioned several cataloguers, reference librarians, department and branch librarians and, through these librarians, faculty who use the libraries a great deal.

Departmental librarians who responded were mostly from science and technology libraries. They believe that L.C. classification is at least as good as Cutter, though some miss the mnemonic feature of Cutter. L.C. needs further subdivision in some parts of Science, and scatters books on closely related subjects, notably when Chemistry overlaps Physics or Medicine. It is better correlated than is Cutter to the sequence of study in Biology. It does not result in long clumsy numbers as in Dewey, does not break logical sets as in Bliss. It is more flexible, in the opinion of one librarian, than Cutter, Dewey, or Bliss. Several think that the faculties are not classification-conscious; one believes that faculty members consider it a good system if it locates a book as quickly as possible "with little fussing." One librarian believes that it is not the *kind* of classification that counts but the consistent *use* of it that makes its application successful.

Representative comments from cataloguers, reference librarians, and faculty members follow:

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(From the cataloguer's point of view)

It is unfortunate that "the better aspects of" the Library of
Congress classification are so intangible, while the limitations
are so obvious. However, the system is well suited to the or-
ganization of knowledge as practiced by the library classifier.
Although comprehensive, it is well indexed through the L.C.
subject heading list and the L.C. subject catalog. The ex-
amples given in the latter also aid the classifier in identifying
the particular aspect of the subject for which he seeks a class
number. The multiple volumes of the classification, though
intimidating to the beginner, are so organized that once the
overall pattern is comprehended, the specifics fall easily into
place. Such divisions as biography, study and teaching, etc.,
within any class come generally in the same progression,
whether the subject be comprehensive or minute. The detailed
expansions from general to specific allow for the ready iden-
tification of subjects with class numbers. The tables demand
a certain alertness, but repeated use of them soon brings
familiarity.

The principal disadvantage in the use of the classification is in
keeping the schedules up to date with regard to new numbers
and new expansions. The indexes, lists of individual authors in
literature and the personal bibliography numbers are impos-
sible to keep up to date, given the present format of the volumes.
With some volumes (BL-BX, for instance) it has been so long
since the last printed revision that there seem to be more cor-
rections and additions than original entries. Also the lack of a
comprehensive guide to the use of the system creates great
problems even for the more experienced classifier. These
limitations however are mere annoyances when balanced against
the general applicability of the Library of Congress classifica-
tion scheme to a large collection.

(From the reference librarian's point of view)

In many ways the preciseness of L.C. is not so useful to the
reference librarian as the broadness of Cutter. For example,
Cutter classifies French language, literature, literary bio-
graphy, and the apposite bibliography more or less together,
where they are easy to locate and to work with. The specificity
of L.C., though, scatters materials instead of bringing them to-
gether.

A principal criticism of L.C. by reference librarians and schol-
ars is that it separates bibliographies from pertinent subject
fields.

L.C. in general seems to be less popular with the faculty library users than Cutter. Our first comment may have bearing here, but the unpopularity—in some measure—can be discounted—in large part a question of getting used to a new system.

Many L.C. schedules are not kept up to date. Current L.C. practices—as well as specific numbers—not known must be inferred from new card numbers. In this respect, there is need for a manual on the L.C. classification.

Though the narrowness of L.C. is in some ways a handicap (see above) it is easier to pinpoint items, the classification adapts itself easily to new subjects and topics, and it is convenient to use the L.C. list of subject headings as an index to the classification —and the materials classified.

Any complaints against L.C. are purely academic—a matter of simple economics, as long as libraries can cut cataloguing costs by accepting numbers on L.C. cards.

(From the faculty point of view)

My general feeling might be that ANY system well administered would be satisfactory . . . . and I find both the L.C. and Cutter system quite satisfactory for my own purposes . . . . I prefer the Cutter probably because the greatest part of our collection is still classified in this way . . . . I have always felt that the L.C. system tried to compress things too much with a relatively small number of over-all divisions.

I would say that, as compared with Cutter, the new system is superior in that the books now seem more carefully categorized and more logically arranged on the shelves. I have not noted, in the Library of Congress system, any cases where two books of very similar subject and comprehensiveness were widely separated on the shelves, a situation which too frequently occurs in Cutter.

I suppose the best argument for the L.C. system is the convenience of using L.C. cards and in having eventually a more or less uniform system throughout the country.

It seems to me that the problem of satisfactory classifications lies more within the jurisdiction of the librarians who make and work with these classifications and not with the users of the library. Because regardless of the faults in the classification, the value the user gets out of the system will probably depend most upon the efficiency with which the card catalog is maintained. That is even if the system is bad, but if the card catalog permits a person to find a book within a very short time, that is all that really matters.

These somewhat extensive local comments will be recognizable, no doubt, in their general tenor, to many librarians who have served in academic libraries in which a change to L.C. has been made. The Wisconsin change did not involve reclassification of past acquisitions. A recent change involving complete reclassification of the entire collection has been undertaken at Michigan State University at East Lansing. There the change is from Dewey to L.C. It is organized as a ten-year operation financed by a special appropriation of $250,000 which provides two full-time professional reclassifiers, four full-time clerical workers and student help. The work was begun in the late fall of 1955. Current acquisitions were put in L.C. very soon after the initial authorization. There are six open-shelf divisional reading rooms at Michigan State and the reclassification is being done in one room at a time, current acquisitions in L.C. being placed at t'ie beginning of the shelf ranges in each room.

So far, we have dealt with the large university library. Is the small academic library using L.C. and how satisfactorily? A study on "Classification in College and University Libraries" by Eaton was reported in College and Research Libraries for April 1955.[17] Its purpose was primarily to collect accurate figures on the number of institutions using the classification schemes commonly taught in library schools. Of the 744 college and university libraries replying to Miss Eaton's questionnaire, fifty-four libraries of 100,000-or-less volumes were using L.C. classification. Of these, ten would prefer Dewey. Four hundred and eighty-seven libraries of 100,000-or-less volumes were using Dewey, and seventy of them would prefer L.C. Surely Dewey has control of classification here.

It seems to be an accepted fact, in the literature, that L.C. classification is not for the small library. "Few small libraries have ever adopted L.C."; "Since it lacks general numbers for many areas, it will never serve very well in the small library needing broad classification"; "Does not lend itself easily to abridgment for use in libraries with small collections"; "The large library will probably find the L.C. scheme more satisfactory than will the small library."

In order to find out how some smaller libraries which had used L.C. classification for some time were faring classification-wise, a brief questionnaire was addressed to college and university libraries listed as using L.C. classification in the 1936/37 and 1940/41 annual reports of the Librarian of Congress, but limited to those libraries which, in the latest *American Library Directory,* showed holdings of 100,000-or-less volumes.[18] In all, twenty-nine questionnaires were sent. Replies were received from twenty-four libraries. Of the twenty-four who answered, four reported that they used *Decimal Classification* and one librarian reported that L.C. had been used but that his predecessor had changed to Dewey in his small combined college-high school library.

In answer to the question, "Are schedules followed as printed?" all answered in the affirmative except one library which used the

term, "Mostly." The question, "Have schedules been abridged?" was answered "No" by all except one library which said, ". . . . in Cutter numbers." To "Do you make alterations in parts of classification?" there were answers of "No," "Rarely," "Seldom," "Few," "Once in a while." One library has an expansion for Lutheran church material, and another uses Lynn classification for Catholic theology; another classes fiction prior to 1930 in PR, PS, etc. rather than in PZ with the idea that older fiction if worth keeping should be in Literature, and if not worth keeping should be discarded. At some future time the "1930" line will be moved up so that PZ will always be fairly recent fiction. Several expressed dissatisfaction with L.C.'s classification of biography by subject.

All but one had student access to the stacks. All believed that the faculty and students liked the L.C. classification, one adding "when they become familiar with it." One reported that the faculty was becoming interested in classifications developed by professional societies for special fields and also in the Universal Decimal Classification.

The following are selections from comments which were made by the librarians who replied:

No one has ever mentioned another classification. Our Reference library in the city uses L.C. and the Public library uses Dewey. Our clientele are familiar with both schemes and use them quite casually.

Our experience has been that students almost never question or comment on the classification, even though they have been accustomed to Dewey in high school libraries. Once they learn to use the card catalog, they accept the number as a matter of course.

Personally, I like it better than Dewey and I have done classifying in both systems and worked as reference assistant with both systems.

I prefer it even for the medium sized college library in spite of the fact that Dewey is easier to keep in mind. Our staff is pretty generally glad we have L.C.

It has seemed to me that 'size' of the collection is not so great a factor in deciding whether or not to use L.C. I think it is a matter of how detailed a classification is needed.

Dewey is simpler and more economical to use in small libraries than L.C., but L.C. works just fine in small libraries too.

From my point of view the L.C. system is very satisfactory, and our faculty members and students have not complained at all, except the Freshmen who were used to Dewey. Basically, I believe one of the most important advantages for the small academic library to adopt the L.C. system lies in the fact that

L.C. gives suggested call numbers in most instances. This makes it possible for small libraries to save money on staff. For example, we have only one professional cataloger, but she can do about 5,000 volumes a year without any help, and this is done on top of her teaching duties which amount to three hours a week, in a subject field.

If there is anything we feel badly about, it is the fact that some one in times past decided to alter the Cutter numbers given by L.C. in order to make them shorter. Now that we have more books than anticipated back in the 1930's, we find ourselves in difficulty.

I firmly believe that any small library wishing to adopt the L.C. system would gain more than it could lose, provided it does not proceed to change the L.C. classification.

As the writing of a paper progresses, many by-paths open up before one and many vistas beckon to lure one away from the main subject. There is one which I would have liked to explore, and that is: With such a *close* classification as L.C., do we need full subject catalogues? Can we defend this duplication of effort?

This paper was opened with a quotation from Gabriel Naudé and I am bringing it to a conclusion with another quotation from him, made in 1627, in which he gives an opinion on this very matter:

After all which, it shall be very requisite to make two *Catalogues* of all the Books contained in the Library, in one whereof they should be so precisely dispos'd according to their several *Matters* and Faculties, that one may see & know in the twinkling of an eye, all the Authors which do meet there upon the first *subject* that shall come into ones head; and in the other, they should be faithfully ranged and reduced under an *Alphabetical* order of their *Authours*, as well to avoid the buying of them twice, as to know what are wanting, and satisfie a number of persons that are sometimes curious of reading all the works of certain Authours in particular.[19]

Notes

1. Gabriel Naudé. *Instructions Concerning Erecting of a Library* trans. John Evelyn (London: For G. Belle & T. Collins & J. Crook, 1661), pp. 74-75.

2. J.C.M. Hanson, "Library of Congress Classification for College Libraries," *Library Journal,* XLVIII (February 18, 1921), pp. 151-154.

3. *Ibid.*, p. 153.

4. Eliza Lamb, "The Expansive Classification in Use," *Library Quarterly*, IV (April, 1934), pp. 268-269.

5. Hanson, *op. cit.*, p. 151.

6. Lamb, *op. cit.*, pp. 268-269.

7. Example: HF39, Economic History of France, but

        HECOA, Coal trade in Australia
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8. B. I. Palmer, "Classification," *Library Trends*, II (October, 1953), pp. 236-248.

9. Margaret Mann, *Introduction to Cataloging and the Classification of Books* (2d ed.; Chicago: American Library Association, 1943), p. 83.

10. H. E. Bliss, *The Organization of Knowledge in Libraries* (New York: H.W. Wilson Co., 1934), pp. 242-278.

11. S. R. Ranganathan, "Colon Classification and its Approach to Documentation," *Bibliographic Organization;* ed. J.H. Shera and Margaret E. Egan (Chicago: University of Chicago Press, 1951), p. 63.

12. Hanson, *op. cit.*, p. 152.

13. Mortimer Taube, "Functional Approach to Bibliographic Organization," *Bibliographic Organization;* ed. J.H. Shera and Margaret E. Egan (Chicago: University of Chicago Press, 1951), p. 63.

14. J.H. Shera and Margaret E. Egan, *The Classified Catalog* (Chicago: American Library Association, 1956), p. 24.

15. Wisconsin, University, Regents, "Laws of the Regents, 1914, Chap. III, sec. 2, Bd. min., 6/20/16; Bd. min., 6/14/51" *Laws and Regulations Governing the University of Wisconsin.* (September, 1951), pp. lv-2.

16. Wisconsin, University, Faculty, "Adoption of the Library of Congress Classification system for Books in the University Library System," *Calendar, University Faculty Meeting, Monday, May 3, 1954,* Document 1133 (Mimeographed).

17. Thelma Eaton, "Classification in College and University Libraries," *College and Research Libraries*, XVI (April, 1955), pp. 168-176.

18. Questionnaire sent to librarians of twenty-nine academic libraries containing less than 100,000 volumes.

Date _____

Name of library_____   Number of volumes_____

How long has L.C. classification been used in this library?_____

Are schedules followed as printed? _____

    Have schedules been abridged? _____

    Do you make alterations in parts of classification? _____

Approximate size of collection classified in L.C. _____

Do *students* have access to stacks? _____

Does *faculty* have access to stacks ? _____

Do you believe that the following are satisfied with the classification:

        Faculty _____

        Students _____

        Library Staff _____

If they would prefer another classification, what one? _____

Further comments: (use verso of this sheet, if necessary)

19. Naudé, *op. cit.*, pp. 90-91.

One Mathematician Looks at the Classification of Mathematics

Robert G. Bartle
Associate Professor of Mathematics
University of Illinois

At the very outset I want to warn you that I am here in the role of a mathematician who is interested in books and that I am entirely innocent of library procedures and terminology, the theory of classification, or the actual classification of anything but mathematical books. I am not sure that words of wisdom have ever come from the mouths of infants, but I am very strongly relying on that possibility. If this hope proves wrong, then I can only apologize and point out that every carnival should have a freak show and that I am only trying to do my duty.

I am also aware of the extensive use of the vertical pronoun in my talk, but I know of no alternative. I have spoken with a number of my mathematical colleagues, but I do not pretend that my remarks are really an accurate statement of the ideas of the mathematical community.

I shall be more than satisfied if I can act as a gadfly and provoke some discussion. Many of my remarks are very frankly critical. However, it is my earnest hope that they will not be taken offensively, but that they might be turned to constructive use. If this can be done, I shall be most pleased.

MATHEMATICAL TERMINOLOGY AND THE RESULTING CONFUSION

I should like to make a few remarks about mathematical terminology which may distinguish mathematics from certain other fields. Unlike chemistry which has a large supply of artificial technical words which is constantly augmented, the tendency in mathematics is to use homely words and to attach a new, technical meaning to these words. Thus, for example, the nouns "group," "ring," "ideal," "lattice," "field," "neighborhood," "measure," "sheaf," "fiber bundle," "place," etc., denote definite mathematical concepts whose exact meaning cannot be guessed—in fact, it is not even apparent in which area of study these words are used. Also, modifiers such as "regular," "normal," "absolute," "proper," "analytic," etc., are used in a quite technical fashion. (The meaning is not necessarily unique, however—the words "regular" and "normal" have well over

a dozen totally different usages.) This is not to say that we mathematicians do not have our words such as "homeomorphic," "isometric," "automorphism," "eigenfunction," but I can think of nothing in mathematics as dramatic as chemistry's word "dichloro-diphenyl-trichloro-ethane" (DDT).

In addition to attaching technical meanings to old, familiar terms, mathematicians often take over proper names; thus we get "Euclidean geometry," "Riemannian geometry," "Riemann zeta function," "Riemann integral," "Riemann surface," "Hilbert space," "Fourier series," "Chebyshev polynomial," and many others.

I am sure that these terminological practices (which occur in mathematical writings in every European language), complicate the job of the non-specialist classifier. Nevertheless, this practice is not likely to be discontinued if the alternative to using the word "measure" is to employ the far more cumbersome equivalent phrase "non-negative extended real-valued countably additive set function which vanishes at the empty set," which, in addition to being unwieldy, itself employs many technical terms. As a matter of fact, the word "measure" is fairly descriptive if one realizes that it is intended to generalize the notion of length, area, volume, mass--in short, the measure. However, it is easy to see that a book entitled *Measure Theory,* by Paul R. Halmos, will cause difficulty to the average librarian. I should like to take an imaginary trip with this book as it leaves the publisher, in 1950, and finds its way into the mathematics library. There is a joke among mathematicians that this book was actually classified, in some unnamed library, with the books on carpentry.[1] A more likely classification would be to put it in 510 V2, since it is published by Van Nostrand in their "University Series in Higher Mathematics." This number does put it in the mathematics bracket, so certainly is to be preferred to carpentry, but I do not feel that it is a very good classification as I hope to make clear later. Let us suppose, then, that the book has managed to elude the Serials Department (which might be possible since the so-called series to which it belongs is not numbered and this is only the second one of the Van Nostrand to be bound in blue.) What is in store for the book now? The answer might be that the Library of Congress card is obtained and the book is classified 513.83, since the book is declared to be concerned with the subject of topology (which is not accurate) and since topology, according to the 14th edition of Dewey, is a subfield of non-Euclidean geometry (which is not accurate either). Although the classification is not correct, it is better than the other possibilities I mentioned, and I would far rather leave it there than to move it to 512.812, which is where the new, presumably more modern and accurate, 16th edition of the Dewey classification system would have it put. Why would they place it there? Because, I am sure, that the designers of this system are under the impression that "measure theory" deals with ideas connected with divisibility and the old-fashioned theory of measurement, sometimes called "mensuration."

They made a guess which sounded plausible, but they are wrong. It is certainly easy to be misled by the similarity of the words "measure theory" and "mensuration," but I regret that the Library of Congress found it necessary to guess not only about the classification of a single book, but about an entire subject.

Another error that it is easy to commit is to group together books dealing with subjects (or objects) identified in part by the name of a man. For example, the 16th edition of Dewey classifies together, in 517.81, books dealing with Riemann surfaces and the Riemann zeta function, even though the content of these books is quite different. Again, one not familiar with the technical nature of these two subjects could not know that they are so different, but I do not feel that one who does not have this familiarity should be revising the classification system without considerable advice.

I have chosen only two examples of errors of this type; others could be adduced if there were any point in doing so.

CROSS FIELDS

There is another phenomenon that occurs in mathematical terminology, although I am sure that it is probably present in most other fields, as well, I refer to the interplay between various subareas which makes difficulties for a linear system of classification. In a sense, mathematics can be broken into five main areas of specialization: algebra, geometry, analysis, a newer area called topology, and applied mathematics (including statistics, mathematical physics, etc.). (In making this division, I have ignored topics such as mathematical logic or the history of mathematics, since I regard these areas as applied logic and applied history.) In addition to these five main fields there are familiar cross fields such as analytic geometry, which is primarily geometry, and algebraic geometry, which was geometry in the past but has recently become primarily algebraic and should be called "algebra with geometric terminology" or simply "geometric algebra." Recently, the similar-sounding fields of "algebraic topology" and "topological algebra" have appeared on the scene. Unfortunately, it is the case that at the present time both terms are misnomers. What is presently done in the temple of "algebraic topology" is algebra, and I think no one disputes it. Worse yet, what most people now do under the name of "topological algebra" is neither algebra nor topology, but really analysis. Even mathematicians, who tend to be somewhat perverse in their humor, do not like this terminological mess and these two misleading terms are gradually being replaced by the more technical and temporarily more accurate terms "homological algebra" and "functional analysis."

I have gone into this fairly extended and relatively technical discussion, not primarily to amuse you with the quixotic character of mathematicians who can't say what they mean or to amuse myself by joking at librarians who can't guess what the mathematicians mean

by what they say. My point is that even carefully chosen words develop new and different meanings, that subject areas merge and change in content and in direction, and that the outsider has little hope of guessing correctly.

The remarks I have just made apply to myself just as much as anyone. Although I have spent some time studying mathematics and have a fairly good exposure to the kind of things studied in its various branches and specialties, I do NOT have the knowledge to classify accurately the mathematics books published today in a system as detailed as the Dewey or the Library of Congress systems. On a number of occasions when I have been consulted by our mathematics librarian, I have not been able to specify the classification without consulting one of my colleagues in the mathematics department. The subject of mathematics is entirely too large and complex for a single man, even a specialist in the field, to keep up in it and to have a detailed knowledge of its interconnections, let alone the main results. Not only has the universal scholar disappeared, but even the universal geometer has gone from the scene.

CLASSIFICATION BY SERIES

I have already noted, with disparaging tones, the practice of classifying books in series. Unquestionably this is appropriate in the case of journals and many of the publications of universities and learned societies. However, I have serious doubt as to its wisdom in the case of a sequence[2] (I purposely avoid the term "series") of books put out by a commercial publisher, unless there is a clear underlying principle or unless the books deal with the same subject. One of the absurd results of this method of classification is that a translation, or a later edition, of a book may be separated from the original. Surely this is a mistake!

I am aware of the greater simplicity and the routine nature of assigning a number to an incoming member of a serial publication. Nevertheless, I believe it to be a poor procedure to follow and an evasion of the problem of finding the proper classification. Perhaps one reason I object is that practically all of the publication of mathematical books is in sequences, but another reason is that I believe that this method is nothing more than a classification by color and design of the binding. One problem I have heard of is the inability of placing a standing order on a sequence of books without assigning the work to the serials division and thus accepting a serial classification. Although it may not be good economics, in most cases I would prefer to order the books separately than do this.

THE DEWEY SYSTEM IN MATHEMATICS

There are a few comments that I should like to make concerning the Dewey mathematical classification. The main one is that it is

about fifty years out of date. Nevertheless, I suspect that it is probably rather satisfactory in a small library, particularly one which does not contain many books in the newer areas of research. For instance, I think it would do quite satisfactorily for a teaching-oriented liberal arts college with only a thousand or so books. The trouble comes when one attempts to give a detailed classification of the books in the newer branches where there is considerable research activity, since the system does not take these areas into account. Even the new 16th edition does not take much cognizance of the extensive developments of the earlier decades of this century, so it is hardly possible to find a location for the diverse further investigations in these newer areas. As an example, the important new branch of topology is relegated to 513.83, which, in addition to being an obscure location, is also inexact, since topology is not a subfield of non-Euclidean geometry. To subdivide the books in the several new branches of topology, as might be desired, would cause the numbering system to become unwieldy. It would seem that a larger category must be assigned to this field *if* one wishes to maintain the present level of detail in the system.

The other side of the coin is that there is considerable waste in the Dewey mathematical classification as it stands. Let me recall the basic outline of the system. It is as follows:

510   Mathematics (including works on Mathematics in general, collections, dictionaries, journals, etc.)
511   Arithmetic
512   Algebra
513   Elementary Euclidean geometry (including non-Euclidean geometry)[3]
514   Trigonometry
515   Descriptive geometry and projections
516   Analytic geometry (including algebraic geometry[4])
517   Calculus
518   —Not assigned[5]
519   Probabilities[6]

The category 511, though needed for smaller libraries, is mostly wasted and should probably be consolidated with algebra in research libraries. I believe that the University of Illinois library has only about 200 books in this category, of which about one-half deal with commercial arithmetic and a large number are old textbooks which have mistakenly found their way into the stacks. Most of 512 is wasted in our library, only our subcategory 512.8 is available for modern mathematics, and it contains almost five times as many books as all the other subcategories combined (even though we do have a number of old algebra textbooks in these other divisions). The same situation occurs in 513 and 516, although to a lesser degree. Entry 514 is a dramatic waste, since trigonometry is such a tiny subject. We have

about 200 books in this category and would probably do just as well with one tenth as many. Still worse, from a mathematician's point of view, is 515; it is *all* waste, for the mathematical portion of "descriptive geometry" is a very small portion of "projective geometry" and the remainder (that is, the major portion of the subject) is not mathematics at all, but mechanical drawing. At the University of Illinois the category 517 is well used and, in fact, our local ground rules permit us to let it spill over into the unassigned category 518. In addition to a few textbooks on calculus, these categories contain many hundreds of books in mathematical analysis. As might be expected, 519 has a substantial number of entries, even though the applications of mathematics to physics and engineering are not included there. This may give an idea how uneven the system is in a large, up-to-date mathematical library.

I have already indicated that I think the Dewey system is fairly well suited for a small library which does not attempt to acquire modern research books in mathematics, but whose books are mostly those that would be needed for undergraduate instruction. The system is rather appropriate for books on this level, and was probably designed with these libraries in mind. But I also believe that for a library of this size and depth there is not much need to go beyond the ten categories 510 to 519. Some additional division might prove useful, particularly in the 510 group, but I doubt that much is really needed. In a large library where there will be several thousand books on mathematics more division is helpful--but only to the extent that it truly conforms to the nature of the subject. Obviously a classification system can never be up-to-date, for there are sudden spurts in the development of certain areas followed by long periods of inactivity. One must be conservative in changing the system and no change is worthwhile unless it is a basic and a fundamental change. Despite these remarks, I do feel that the Dewey system in mathematics needs to be updated *if* it is to provide a detailed system of classification, for it does not even get close to the frontier. However, one of the questions that must be decided is whether such a detailed system is really desirable and whether it is even possible at the present time.

To my mind, the 16th edition of Dewey does not solve any of the real problems. It corrects a few errors, but propagates most of the old ones plus a few new ones that would be unfortunate to introduce. It is certainly not a step forward, and I doubt that its good features are worth the cost and confusion that a change would cause.

POSSIBLE CHANGES AND MODIFICATIONS

There are many problems that must be solved by any new system and I am sure that everyone here is better acquainted with most of them than I, so I shall refrain from going into much detail. Still, let me list a few desiderata for any new system that occur to me.

1) It should accomodate small libraries easily.
2) It should be appropriate for large research libraries.
3) It should allow the classifier to assign class numbers to the books quickly and accurately.
4) It should be simple enough so the faculty can understand it.
5) It should permit future modifications.
6) It should not be too expensive to adopt.

There are certainly other desirable things that we might hope for, but we have already been somewhat optimistic. As you might expect, I am not going to present a completely-worked out solution to this problem today. I *do* believe that a thoroughly satisfactory system is possible. However, I believe that any such solution must be the product of joint thinking and arguing on the part of *both* librarians and mathematicians. I am convinced that neither group can reach a reall satisfactory solution without the other, for I believe that a non-speci: ist is unable to decide what the basic categories in a field are and is unable to determine how these categories are related without consulting a specialist. Further, I believe that the specialists are not sufficiently aware of library procedure and problems to anticipate all the difficulties that come up in practice.

Desired property 3, perhaps, can use some amplification. I cannot overemphasize the importance of quick and accurate classificatic In the mathematics of today (as in most fields) the first few years of most books' lives are the most useful ones. If it takes several month to obtain a book and then several weeks to classify it, much of its value has been dissipated. Also, if the actual classification of the book turns out to be inexact, it may not reach the hands of a user while it is of prime value. I should also like to note that there is still some indefiniteness about the nature of the classifier referred to in 3—it is obvious that the more detailed and specific the classification system is, the more specialized the classifier must be in orde to be quick and accurate in his work.

Desired property 4 is not to be overlooked, either. You know bett than I how well the average professor really understands the system he is using and complaining about. (I leave open the question of whet er he might complain more or less, if he understood it.)

Before I turn to a slightly different topic, I should like to make reference to a method used in the classification of research papers by the *Mathematical Reviews,* which is published by the American Mathematical Society. This system has almost no resemblance to either the Dewey or the Library of Congress system, partly because it is right up-to-date, partly because it was made by mathematicians partly because it is designed for papers and not books, and partly be-cause it does not take into consideration many problems that a librar classification must consider. Nevertheless it is interesting and any of you who are concerned with this problem would do well to write to the editors of the *Mathematical Reviews* and get a copy.

Before a more satisfactory system is created, there is a basic question that must be settled. It is to decide how elaborate and detailed the system is to be and, of course, this is intimately tied with who does the classifying. Clearly there is an advantage in having a system in which one knows exactly where the books on the Fredholm integral equation of the first kind are to be found. However, the advantages of such a refined system largely evaporate if, either (1) most books dealing with this topic also deal with another topic, or (2) the subdivisions are so small and numerous that they are frequently missed and the book shelved elsewhere, more or less by mistake. I believe that only a mathematician who specializes in the area can really determine whether (1) is apt to be the case, and to a large extent (2) is up to the classifier.

I maintain that a system is too elaborate for a given institution when most of the detailed categories have only a few entries. I believe it is too elaborate for the classifier in a given institution if he is unable to classify quickly and accurately most (say 95%) of the books. I would further say that the system is too elaborate for the faculty of the institution if they are not able to keep in mind the scheme used in classifying books in their area of specialization.

Although an updated system would be a great help, I do not believe that I would meet my own adequacy criterion on speed and accuracy for a system as detailed as the present Dewey or Library of Congress systems. Further, I do not think that any single person, be he librarian or mathematician, can meet this criterion—in any case there are not enough of them to go around. Therefore, unless each institution is to have a panel for the classification of mathematics—a situation I find somewhat difficult to imagine—I believe the alternatives are (1) to have the more technical books classified by some centralized bureau, (2) to encourage the classification to be done in part by the author and/or the publisher, and (3) to simplify the system of classification mostly by reducing the number of subdivisions. Actually I would like all three of these to be employed to some extent, but I think that the third is by far the most important and most practical.

It seems to me that the Library of Congress is the natural organization to attend to the more technical books, but it is my understanding that they do not always suggest classification and, as I have indicated, when they do make such suggestions in mathematics they are frequently wrong. Certainly they need more mathematical advice than they are presently getting. If they are not able to obtain technical advice directly, then they should turn to the various technical societies, such as the American Mathematical Society, the American Chemical Society, etc. Another possibility is that various of the reviewing organs (which appear to be staffed primarily by scientific personnel), might lend their aid in the classification of the more

technical books and/or the propagation of this information. In any case, I see no reasonable alternative to some type of collaboration between people trained in library science and people trained in the particular disciplines.

An elaborate system puts extreme demands on the classifier and on the user. The more detailed the system, the more difficult it is for both the classifier and the researcher to learn and to use, the more rapidly it goes out of date, the more sensitive it is to errors of classification and to shifts in the emphasis in the subject matter. My personal feeling is that a highly refined classification in mathematics is not practical at this time.

Since I have come out for a simple system, let me be specific as to how simple I would make it. I have in mind a system of basic categories that would be used by small non-research mathematics libraries with additional categories that would be of use to a more extensive library. For the smaller library, after giving items like mathematical tables, collected works, history of mathematics, and dictionaries and encyclopedias of mathematics their separate entries and adding 30% out of conservatism, I come up with the grand total of twenty. I think that even the largest research mathematics library does not really need more than fifty divisions in mathematics. (My real figure is thirty-two, but conservatism makes me jump to the larger figure. I have discussed this matter with a colleague at Northwestern University, and his suggested figure was seven, but I think he may be somewhat radical.) One of the best research mathematics libraries in the country, at the Institute for Advanced Study at Princeton, has found that it does nicely with two categories—books and journals. (It is only honest to admit that they are not at all concerned with elementary books and purposely want to keep the system simple, since most of their users are only there for a year or so.)

SUMMARY

Let me summarize my remarks.

1) I believe the present Dewey system in mathematics has profound drawbacks and should be changed to conform more to the present nature of the subject.

2) I suggest the Library of Congress obtain help from a panel of mathematical specialists both in regard to the system and the actual classification of individual books. Assistance might be forthcoming from its sister organization, the National Academy of Sciences, or from the editorial board of the *Mathematical Reviews,* or from the International Mathematics Union, or from the American Mathematical Society.

3) I believe it should be examined as to how detailed a mathematical classification system we need and can properly apply. My own

opinion is that we could reduce drastically the number of categories without harm and with a gain in simplicity.

4) I think the list of approved subject headings should be revised in the light of current mathematics. If a small number of classification entries is employed, a fuller list of subject headings might be useful. In any case a modernization is in order.

5) I feel that the author of a book has the most intimate knowledge of its content and is best qualified to indicate appropriate subject headings. To some extent, he could assist in the classification.

6) The publisher should be encouraged to print the classification number and the subject headings inside the book along with the number of the Library of Congress card which many of them now carry. Agreement on the classification number and the headings might be accomplished at the time of the application for copyright.

In conclusion, I would like to say that I am at least cognizant that there are many difficulties which would have to be surmounted in accomplishing these proposals and not so idealistic that I expect much to come of them. However, I believe that the cost of inaugurating and implementing these hastily sketched suggestions would be small compared to the present procedures. I believe that the salvation, at least of mathematical classification, lies in its simplification and in the use of specialists for consultation, and not in the use of library gimmicks such as classification by series.

Notes

1. Another joke is that a book entitled *Rings and Ideals* was classified as fiction.

2. The collection of numbers: $1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \ldots, \frac{1}{n}, \ldots$, is a sequence. If we attempt to add it up, we get the famous "harmonic series," $1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \ldots + \frac{1}{n} + \ldots$, which fails to converge and so is better left as a sequence. It seems that mathematicians turn sequences into series by trying to add them whereas librarians do so by classification and binding them together. Sometimes they are best left alone.

3. This is a 16th edition heading; in the 14th edition the term is Geometry.

4. The Algebraic Geometry was added in the 16th edition.

5. No subject is assigned to 518 in the 14th edition, but the 15th edition assigned it to Special Functions.

6. The heading Probabilities was changed to Probabilities and Statistical Mathematics in the 16th edition.

Classification in a
Special Library

Isabel Howell
Director, State Library Division,
Tennessee State Library and Archives

A paper which is to be read before an audience of librarians and students at a conference held as one of the activities of a distinguished Graduate Library School should doubtless begin with a definition of terms. This would be fine, but this paper is scheduled near the end of a three-day session, and it seems likely that a great deal of defining of terms will have taken place already before this combatant takes the field. Already many a shower of word-arrows will have darkened the sky before this knight-errant thunders over the turf. In which quarter the battle will have been fought to a pale, pink finish and where the refugees may have fled before this Don Quixote is wheeled into position for the charge, there is no way to predict. But this paper has a specific title, and the writer has a specific purpose and even at the risk of repeating what is already well-known to everybody, I feel obliged to begin with a few general remarks, call them definitions, if you please, for the sake of the record.

The simplest definition of a special library is this: A special library is a collection of books devoted to a special subject. But for purposes of organizing a discussion of classification this simplicity is misleading. In 1953, the Special Libraries Association had a membership of 2,489.[1] In the Special Collections index found in the *American Library Directory,* there are several thousand special collections listed. Many of the special libraries in the Association are very large research libraries; many of the special collections are found in very large general libraries. There are far too many subjects involved for me to attempt to deal with them, but out of the whole dilemma, several points finally emerge, which I would like to note in passing: The special libraries seem to revolve around about seventy-five subjects, no more. The libraries devoted to Law, Medicine, Theology, Music, and the Theater have formed large associations of their own; libraries serving the other subjects make up the membership of the Special Libraries Association. Even in 1951 the special classification schemes, which were then on file with the Association dealt, for the most part, with these seventy-five or so main topics. There is a 1958 list which I have not seen.[2] How it has changed since 1951, I would like very much to know; but I do not believe that I will ever be able to arrive at the matter of how to organize a discussion

of classification in a special library from this approach, or this definition, and I must search for something more specific.

Another definition of a special library is the one employed by John L. Thornton who says in his book called *Special Library Methods,*[3] "A special library is one devoted to the use of special sections of the community." He classifies by function rather than by stock, and all libraries other than public and county libraries are considered. Included are the technical and commercial branches of university libraries and even the university libraries themselves which, he says, are a string of special collections whose functions are special although their stock may embrace all literature and all knowledge. This definition is not at all satisfactory to me either. It would make my paper overlap with several others. I wish Mr. Thornton could have been more specific about functions. I think he is correct that it *is* function rather than stock which makes a special library special, but he seems to refer to the reference function only. He has not singled out anything else.

The definition which is entitled "What Makes Us Special?"[4] I find most provocative was proposed by Katharine Kinder in an article in September, 1953. It is a simple, practical statement. She says in the first place: "the special library exists as a service unit within an organization *having non-library objectives*." I am aware that this phrase "having non-library objectives" lacks precision. I wrote two pages about it, but this paper is addressed to a special audience, and there are easier ways of dying than being bored to death. Miss Kinder is employed by the Johns Manville Research Center, and I think we all know what she meant. I tore up the wordmongering and propose to accept the phrase at its face value for the present. I will come back to it shortly.

Miss Kinder says in the second place: "Library materials are collected and information services developed with the needs of the special organization in mind." And in the third place she says: "The special library is usually a small one both in amount of material held and in number of staff members."

To repeat, then the three characteristics of a special library are:

(1) Sponsorship by an organization which exists by non-library purposes.
(2) Custom-made services.
(3) Small size

I think the effect of sponsorship on the library's stock-in-trade is profound, and thus indirectly, by regulating the stock, it regulates the choice of classification system. We shall refer to the streamlined services and small size in passing as we discuss the important issue of sponsorship.

To make a beginning, let us take on one hand the scientific department library of an average, medium-sized university. On the other let us describe three specialized libraries in the highly specialized

city of Oak Ridge, Tennessee. In this assortment, two of the libraries would satisfy Miss Kinder's requirements as special libraries, two would not.

The first type for our consideration, the departmental library, meets all of Miss Kinder's specifications but one. It certainly functions as part of the departmental organization. The librarian does all sorts of odd chores for the department. Space is always limited, and the staff is sure to be small. Although the General Library tries to give satisfaction about the technical processes, the department is free to criticize the administration and you may be sure does so roundly. The departmental librarian can, if she wants to, arrange the books by size. But notwithstanding this appearance of freedom, one seldom finds any extensive collecting or cataloguing done in the departmental library. Indexing, yes, perhaps, but information files, if they are kept, are usually ephemeral, as, for example, trade catalogs in an Engineering library. The shadow of the Main Library falls across everything, and certainly it exists "for library objectives" if the phrase means anything at all.

The classification would have to be brought into some sort of harmony with the over-all scheme, and around this the criticism usually centers. The general library classifier does not have the department's special interests in mind. The classifier feels the pull of other departments and suffers from lack of contact with the men in the field. She is properly unwilling to force books into numbers or letters where the department has pet projects or vacant shelves, but no matter how correct she may be, when the books reach the department, they must be put on the existing shelves, and everything has to be shifted and dummies substituted if the books will not fall into the desired places. Some may have to be returned to the General Library to make space, but the department would hardly be free to throw them out, then and there. The department is a special collection, without doubt, but it functions as part of a whole, and nobody is permitted to forget it. Many of the special classification schemes collected by the Special Libraries Association, referred to above, were made by large libraries for their departments.

Several years ago E.M. Grieder contributed to *Special Libraries,* a fine article called "Functional Independence in Special Libraries."[5] He writes especially of professional college or school libraries in universities, including large departmental libraries. He argues that the classification and subject heading work should be done in the department because it makes, he says, a better atmosphere. Even if this were done, it would not make any difference in the matter of sponsorship. The shadow of the Main Library would be none the less present.

Samuel Sass of the General Electric Company Library in Pittsfield, Massachusetts, estimated the number of special libraries which are really parts of large public and academic libraries at about 500. If these were withdrawn, the total number of real special libraries would be reduced to about 2,000.[6]

When the visiting librarian goes to Oak Ridge, it is hard to see the woods for the trees, as we say in the vernacular. Fortunately, there was a fine article written in 1947, "A Cataloger's View of the Atomic Energy Commission Library Program."[7] After the reorganization of the whole lay-out in 1948, another article appeared in the *Tennessee Librarian*. The two together give a much clearer picture than either one alone. The following account is abbreviated from the historical summary of events provided in these two articles.

When the atomic age dawned on December 2, 1942, the first operation at Oak Ridge was begun by the Manhattan Engineering District of the United States Corps of Engineers. At that time two significant decisions were made. One was to pursue several methods for separating the fissionable isotope of uranium. It was not known at that time which method would prove to be most efficient. One contract was given to the Tennessee Eastman Company working with University of California scientists and associated firms; a second was made with the Carbide and Carbon Chemicals Company working with scientists from Columbia University; a third contract was made with the DuPont Company working with men from the University of Chicago. In 1946, there was established the Atomic Energy Commission which took over from the Manhattan District. The contractors varied somewhat until at last Carbide became the chief contractor to operate the research and production activities of Oak Ridge. To carry out its training and educational activities, the Commission then made an agreement with a number of southern universities to organize and operate the Oak Ridge Institute of Nuclear Studies. At present there are thirty-six universities sponsoring this Institute which purchased some forty acres of land for a permanent campus.

The Institute of Nuclear Studies, then, has a library to which I will return shortly. Since 1955, the Union Carbide Nuclear Company has operated the Oak Ridge National Laboratory and the Oak Ridge Gaseous Diffusion Plant. Both of these plants have libraries.

The Oak Ridge National Laboratory Library which consists of a Central Research Library and three branches, now occupies 26,000 feet of floor space and has 70,000 scientific books and journals and 130,000 reports. The budget is $300,000 and the staff numbers 37 members. All the usual functions of procurement, organization of materials, reference, and loans are performed. A full-time translator is useful. A photocopying service is maintained. Indexing and bibliographical projects are carried on in connection with the large report collection. The whole operation is called a research laboratory. Much of the material is "classified" they say, but here the matter of semantics raises its head in elementary form. They are not using library terminology, but I shall not belabor that point for this audience.

The next library, that of the Oak Ridge Gaseous Diffusion Plant, also operated by the Union Carbide Nuclear Company, consists of three parts: the Central Library, the Engineering Library, and the Film Library. Reference, bibliography, abstracting, and indexing services

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are performed. A reference collection containing one copy of each Atomic Energy Commission Report has a card catalogue of its own. For the Engineering Library, specifications and standards from federal and industrial sources are procured and kept. The Film Library consists of training and safety films for the use of the staff. The information that the library has broad activities, that it provides films for the Christmas party and garden books for the engineers, does not strike me as significant one way or the other.

Both the Gaseous Diffusion Plant Library and the National Laboratory Library are special libraries, I think. Not a single word to they let drop about how the books are arranged, but they are mighty sharp about some other things. The fact is that the librarians are simply not interested in anything but the purposes of the organization. We invite them to association meetings but they seldom come. I think that if I were asked to design a coat-of-arms for the city of Oak Ridge, I would emblazon for them on a field of electric blue an IBM computer, rampant.

The Oak Ridge Institute for Nuclear Studies Library is, however, a very different matter. The institute is, as I have said, a non-profit educational corporation of thirty-six universities. The most of its programs and activities are carried out under direct contract with the United States Atomic Energy Commission, but it also administers some programs for the National Science Foundation in cooperation with the Commission. The whole Institute has a staff of about 200 in four program divisions: (1) University relations, (2) Special training, (3) Medical Division, and (4) the Museum Division which operates the American Museum of Atomic Energy and the Atomic Energy Commission's traveling exhibit program.

A union catalog for the area includes cards for the Union Carbide Nuclear Company's Library in Paducah, Kentucky. A list of 3,000 serials available in the Knoxville-Oak Ridge area has been published. A strange silence is preserved about the physical arrangement of the books, but let us go on about the stock. Books and periodicals on the sciences and the uses of atomic energy constitute the major part of the library's 30,000 volumes. Over 2,000 of these are on microcard. An important segment of the collection is devoted to medical literature. Foreign language dictionaries and reference books and books on industrial management are important. The documents collection contains "non-classified" reports. It is felt that the library bridges the gap between the plant libraries and the community. The public has access to the shelves. A "Book notes" column appears in the local newspaper. The Library contributes cards to the National Union Catalog and new serial titles to the apprpropriate publication. Most of the material appearing in the *Nuclear Science Abstracts* is held in this library. All of these activities constitute, in my opinion, operation for "library objectives."

Still, nothing is said about book classification, but by referring to the earlier article by the cataloguer one finds that the Library of

Congress system was in use in 1949, and it is certain that it still is. This is not surprising. It is clear from the library's participation in national projects that this library sees itself not as a small self-contained unit like the others, but as a working part of the real whole. The whole may have no physical body; it may exist only as a disembodied ghost, but it is an entity in the mind of the librarian and the organization responsible for the financing, and it exercises a control over the library similar to that which the deceased King of Denmark exercised over Hamlet. A classification scheme had to be used which would place the books in some definite order, related to the order in other libraries which were also parts of the same whole—the embodied parts of the ghostly whole, if you please. The form of the ghost begins to take shape. Whatever it is, it was brought into being by the desire of some libraries to pull together—to cooperate.

Samuel Sass writing in *Special Libraries* for April, 1959, points this up nicely.[8] He quotes Mr. Schwegman of the Library of Congress staff. Mr. Schwegman attributes the absence of special libraries from cooperative enterprises to their lack of cataloguing controls and fluctuating collections. He admonishes us, the special libraries, to raise our professional standards. A reply in the following issue of *Special Libraries* states simply that special libraries are not supported for cultural reasons but for their usefulness to business. "We" the author says, "work under pressure".[9] There is a different kind of pressure, however, which has the opposite effect. We, too, work under pressure, but it is pressure of a special sort.

The Tennessee State Library, for example, belongs in the class with the Institute for Nuclear Studies Library. Our book stock, goodness knows, bears theirs no resemblance, but there is another function which I believe we have in common. This is a function simple to state, but very hard to live with. When it comes in, peace goes out. It is the function that might be called service to scholars. The trivia of today become the source materials of tomorrow. Discarding is a desperately serious matter. The collecting program is extremely heavy, and cooperation is the only hope. It is essential, if we are to survive, that we visualize ourselves as part of a whole. This may be some sort of logical fallacy that makes me connect our situation with that at the Institute. It may be *argumentum ad hominem* or it may be our old friend *post hoc ergo propter hoc*. Call it either one or both, but I believe that the same thing affects us that affects the Institute.

We could be a modern stream-lined library if it were not for the scholars we serve. We could stop our present method of cataloguing and punch cards. We could abstract articles from books, magazines, and newspapers, and we could number our ninety-five counties, the T.V.A., Jackson, Polk, and Johnson, Davy Crockett, Cordell Hull, and Sergeant York. If not that, we could make cards for about four hundred uniterms which would see us through with a number left over for Tennessee Ernie. Then we would be all ready to go. Go where? Oh,

we could answer all sorts of questions! What questions? Now this is no matter for jesting.

There is no doubt whatever that a good index would help us. There is not a single good historical index for the State of Tennessee any better than the one in the Tennessee W.P.A. Guide. The index we want would cost us about $30,000.00. Very few states *do* have good historical indexes and we all need them. It is true that a large number of our questions are fact-finding questions, but there is another type, too. A searcher might want to see everything we have on a certain locality—Hamilton County, for example. You might as well say to a card catalogue "all those who are absent raise their hands." Under how many different headings is that locality a subdivision? But a retrieval system would handle the question easily. So would about five hundred cross-references in the catalogue. There is, however, still another type of question, which we find difficult to handle. The client may say, "I am interested in the half-breed Cherokees in Tennessee. I think that many of them did not go to Oklahoma. I want to make a study of the Indian removal with the half-breeds especially in mind." The best answer to that is found in the shelf-list under E78, E85, and E99. We shall be looking for books with biographical appendices. The notes on the cards, and the subject headings will do their share of the work. We need information retrieval all right, but we also need a good card catalogue and a good shelf list arranged by a well-made classification scheme. The Institute needs the same thing we do. It is the teaching function and its attendant responsibilities which require a library operated for library purposes. The book collection must be allowed to build itself up without too tight a rein put on it by discarding to make space; and the classification should be, as Mr. Ranganathan puts it, "non-critical." It should have "Reticence." Indeed it should.

For another reason, too, the classification is important to a library which aims at completeness in its chosen field. We need it to indicate to us where we stand on our collecting program. Nothing shows up gaps in a collection like a good arrangement, designed by an expert in the field. Again, when we must report our holdings to some agency preparing a *Guide for Research* (something like Dr. Philip Hamer's projected *Guide* for the National Historical Publications Commission) we need a good classification. It would be impossible for a librarian "imperfectly educated" (to use Mr. Allen Tate's courtly term) to write an adequate summary without a well-made shelf list to lean on. It is not an accident that there are four special libraries invited to the meetings of the Southeastern Research Library Association: the Air University at Maxwell Field, the Institute of Nuclear Studies, the Virginia State Library, and the Tennessee State Library. The reason for their inclusion in this group is, to paraphrase Edwin Markham:

They drew a circle that shut us out,
Heretics, rebels, things to flout;
But Love and we had the wit to win—
We drew a circle that took them in.

Love is a strong word. Perhaps we were only possessed by an accretion of foresight. In any event, we saw what Ralph Esterquist wrote at the time of the organization of the Mid-west Interlibrary Center,[10] "Few special libraries are able today to operate independently of the great university libraries, and in the world of tomorrow they are going to be even less able to be all things to their users."

As an example of the truth of this statement, I want to quote what the onetime director of the Kentucky Legislative Research Commission said to me several years ago. I went with a young woman from the Tennessee State Planning Commission to a meeting of the National Legislative Conference, which took place in Madison, Wisconsin. It was an excellent opportunity to make some observations about the operation of Legislative Reference Libraries. I was new at the Tennessee State Library and pursued the matter with great industry. The Kentucky director had a Ph.D. in history and I knew him to be well able to hold his own in research work. I sat by him in the plane going back to Chicago. He was most insistent that the Commission needed a specially organized library of ephemeral material, clippings, pamphlets, and such. "What do you do?" I said, "When you have a really weighty research report to work out?" "Oh", he said, "I go to Lexington, to the University of Kentucky Library." Yes, a special library is as independent as a hog on ice. Or, to use a more dignified quotation: "Let him who thinketh that he standeth take heed lest he fall."

At this same meeting, I made another observation which brings up the next point I want to make. I think that a special library often has an exceptionally large amount of non-book material in its collection, and from this circumstance some of the special expansions of classification result. For instance, in the Wisconsin Legislative Reference Library it was the custom to put items such as reprints, brochures, small pamphlets, and other oddments in envelopes which were classified to stand on the shelves. This is an old library and modern equipment for ephemeral material was not available. I believe that vertical files did not become popular until after 1912. Anyway, the shelves crawled with pamphlets in Gaylord binders just as the Tennessee State Library's shelves used to do. I think that the library had this material catalogued and that it tended to slow down the weeding and discarding of it at the same time that it slowed down the binding of monographs and periodicals. I think that the non-book material necessitated the creation of an expansion of the classification or the use of a special scheme like Glidden's to take care of it, and I think that separate uncatalogued collections of reprints, maps, and clippings would have been a better solution to the problem.

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An article by Gracie B. Krum on the Burton Historical Collection in the Detroit Public Library[12] was especially interesting to me since our field is local history. Miss Krum said that they, too, classify all sorts of things like clippings and photographs and programs. They did, at the time that the article was written, type the Dewey number for the locality in red over the subject number. They also prepared and filed in the catalogue analytical cards for articles in the *Michigan History Magazine,* now called *Michigan History.* The *Magazine* published an index to volumes one through twenty-five in 1944, but since that time there has been no other cumulation, and it is now necessary to search sixteen volumes individually. I have been investigating the matter of indexes for the purpose of making the Tennessee Historical Commission as miserable as possible. An index every twenty-five years is not unusual in the state historical field, but one longs for a big volume like Swem's *Historical Index of Virginia History,* or for a regular system of indexing like the beautiful *Mississippi Valley Historical Review* which cumulates a new one every ten years. How much better it would have been if the library had prepared copy for a printed index which all of us might purchase! New methods of off-set printing make this less expensive than it used to be.

Please do not think that I am comparing our library with its large rangy responsibilities as a state library with the beautiful Burton Historical Collection. I do want to say, however, that when each appropriate state agency shoulders the responsibility for a state-wide collection of newspapers, guide to place-names, list of state maps and atlases, guide to manuscript collections, and so forth and so forth, and when state historical agencies index their quarterlies, there will be less necessity for large, closely classified collections supported by special classification schemes and catalogues.

It is not the purpose of this paper to criticize or evaluate any of the classification schemes used by large public or university libraries. I do want to say, however, that in the special library world the silence which seems to brood over the subject of classification is explained, in part at least, by the 20% who are members of the research family by birth, and the 20% who are members of it by adoption. These libraries find fault with the systems used, but extensive departures would entail consequences which they do not care to face. We are guilty ourselves. We try to unload the responsibility on somebody else. We wish devoutly that somebody would put L.C. numbers on cards made by the Bureau of Railway Economics and oh, how we wish that the Library of Congress would get on with the K schedule.

But what about the rest of the libraries - the ones that exist by reason of their usefulness to the business which supports them, the ones whose major responsibility is to serve each his own master? Miss Kinder takes another step in describing them when she says: "Some less typical functions are records management and the arranging and indexing of company papers. Responsibility for historical and archival material is frequently delegated to the library." It

seems likely to me that "company papers" are, in many cases, manuscript collections, classified (if they are classified) by rules elaborated in the *American Archivist* rather than in library journals. This archival responsibility makes a complicated situation which, I believe, with Miss Kinder, is not unusual in a special library.

For example, in the Methodist Publishing House Library we had a collection which required book cataloguing and classification at the same time that it served an archival purpose for the organization. I want to explain what I mean by this because it brings up the last point which I want to make.

The Methodist Publishing House Library in Nashville was established long years ago as a service primarily for the Editorial Division of the old Methodist Episcopal Church, South. When the various branches of the Methodist church were united, the libraries from Cincinnati, Chicago, New York, and other centers were moved into the Nashville Library and combined. This gave us an exceptionally fine collection on the Church and on Methodism. We had, besides, copies of all books published by the various branches of the church on many different subjects. Gradually, as the Publishing Division came to trust us (and also, one might add, as their problem grew more acute) we became the custodians of the mint copies which were held by the Division as a very serious publishing obligation. Since these had to be kept sacred, we were obliged to keep additional copies for the use of readers. It was a collection of about 30,000 volumes with many different imprints. We found full cataloguing and classification necessary to keep the books in order. We used the Library of Congress system with a special expansion to take care of the Sunday School literature.

Every four years, after each General Conference, a new Board of Education designed a new set of Sunday School books. We arranged these in chronological order so that the output of each Board could be distinguished from that of every other. Soon we noticed that in the changes of format and in the subjects chosen for study we had an independently interesting and constructive historical record. I believe that the Publishing House Library is the only one in the world where such an observation on Sunday School literature could be made. The development, for instance, of the idea of friendly animals makes a curious commentary on a changing civilization. A bear came up to our car window one day in the Smokies. Looking in his face, I was not so sure about this friendly animal business. I think it would have been met with outright ridicule a hundred and fifty years ago.

The expansion we used was essentially an archive expansion on a subject classification number. It fit neatly into the closely classified Methodist collection making a contribution of its own in doing so. It was a unique expansion, but it was a unique collection serving a unique purpose. It did not occur to us to send a copy to the Special Libraries Association. I will come back to this in a few minutes.

The remainder of the library was a small working reference

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collection for the use of the editors and the staff. Space in the reference room was limited; when a new book came, an old one had to go. We found that we got along nicely with no classification at all. We used the time saved to index obituaries, but Mr. Schwegman was correct. We lacked bibliographical controls and the collection fluctuated. I think that this situation, great thoroughness on one hand and great simplicity on the other, is characteristic of many special libraries.

Now to return to the *Loan Collection of Special Classification Schemes* of the Special Library Association. I am going to crawl out on the end of a limb by expressing a few personal opinions. It seems to me that many of the special schemes are a clear waste of time. Many of them are undated and consist of one or two typed sheets. Many came from the same three or four large college or public libraries, not special libraries, but libraries hardly comparable to the Library of Congress. Many of these expansions were made before the L.C. schedules were published. If it is true that special libraries are usually small and the librarians trained in the subject rather than in library science, the poor things should be warned against special schemes--the very thing which *this* collection seems to encourage. The arrangement of books ought to facilitate the building up or the rounding out of the collection, and it is impossible, I think, to make a good plan based on anything but a very large collection. The leaving of space in the scheme ought to indicate that books to fill the gaps are known to exist. The library can then be selective, but the librarian ought to know the framework of the whole subject from the start.

To repeat, then, I think that it is usual to find in a special library great complication side by side with stark simplicity. For the former a classification based on a larger collection is indicated. For the latter either a system which can be simplified, as L.C. cannot, or no classification at all would suffice. It would be found, I think, that from the study of the complicated schedule--many of the non-book collections would fall into place--and the whole conception of the special library's function would be clarified. The special library would then stand between the company and the community to the advantages of both.

In closing, then, I want to call attention to the need in library schools for more teaching of different methods of classification; not that one expects them to be used, but that the contemplation of several systems puts the ubiquitous Dewey in a better light. With the air full of Documentation and the public libraries full of everything on earth but books, it is no time for us to make babies of our young people teaching them B for biography, F for fiction and a Cutter number taken from the author's name. If the Library of Congress system were taught first, the other system would be easier later and one could be sure that the student had at least had a good look at a large field. The conception of non-book material in the regular schedules and the use of chronological and geographic tables would be of great advantage no matter what scheme the student might use later. Then

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if a brief introduction were given to archive work, government docu-
ments would not seem so alien and so difficult.

The current emphasis on Documentation seems to me to be whole-
some, but I find myself in a position of some opposition to Mr. Ranga-
nathan as he expressed himself on "Special Librarianship".[12] He
says that the special librarian needs to make a shift from the thought
unit of the book to the thought unit of the periodical article. I say so
does she need to raise her eyes from the microscope to take a look
at the wide world of the whole profession. Documentation on one
hand and cooperation on the other ought to see us through. For
Coperation we need Classification; for Documentation we need Scholar-
ship; let us attack the problem with renewed vigor. The game is
worth the candle.

Notes

1. *Directory of Special Libraries* (New York: Special Libraries
Association, 1953).

2. Bertha A. Barden and Barbara Denison (comps.), A *Loan Col-
lection of Classification Schemes and Subject Heading Lists* on De-
posit at Western Reserve University as of November 1, 1958 (4th ed.;
New York : Special Libraries Association, 1959)

3. John R. Thornton, *Special Library Methods, an Introduction
to Special Library Methods* (London: Grafton, 1940).

4. Katharine L. Kinder, "what Makes Us Special?' *Special Li-
braries,* LXIV (September, 1953), pp. 274-275.

5. Elmer M. Grieder, "Functional Independence in Special Li-
braries," *Special Libraries,* XXXIII (March, 1942) pp. 73-75.

6. Samuel Sass, "Must Special Libraries be Parasites?" *Special
Libraries,* L (April, 1959) p. 150.

7. Charlotte Forgey Chestnut, "A Cataloger's View of the Atomic
Energy Commission Library Program," *Special Libraries*, XL
(November, 1949) pp. 367-370.

8. Samuel Sass, "Must Special Libraries be Parasites?" *Special
Libraries,* L (April, 1959), pp. 149-154.

9. Charlotte Wilcoxin, Reply to above article, *Special Libraries*,
L (July-August, 1959), p. 264.

10. Ralph T. Esterquist, "The Midwest Inter-Library Center",
Special Libraries, LXI (December, 1950), pp. 348-349, 371-372.

11. Gracie B. Krum, "Classification and Treatment of Local His-
torical Material," *Catalogers' and Classifiers' Yearbook,* Number
Eight, 1939, (Chicago: American Library Association, 1940), pp. 76-81.

12. S.R. Ranganathan, "Special Librarianship—What It Connotes)" *Special Libraries*, XL (November, 1949), pp. 361-367.

What Lies Ahead in Classification

Jesse H. Shera
Dean, School of Library Science
Western Reserve University

Of all the modes of human intellectual activity prognostication is probably the most treacherous. It may not influence people, but certainly it will alienate one's friends. No one paid much heed to the warnings of the unfortunate Cassandra, and there is no record that either the Oracle of Delphi or the Cumaean Sibyl had any bosom companions. But every well-ordered conference needs a sacrificial goat, and for that role I probably possess a natural affinity, even though my sex may differ from that of the Sibyls.

Because the crystal ball is always, at least potentially, cloudy the temptation is ever present to seek refuge in definition, ambiguity, or riddles. It was no accident that the Sibylline leaves were scattered. Thus one might be quite within his rights to ask rhetorically what is meant by librarianship? by classification? and by the future? Doubtless, I too will end by "hedging my bets" in this way, but for the moment, at least, I shall throw discretion, rather than prophetic words, to the winds and declare bluntly and without equivocation that I think library classification is here to stay.

Not long ago I remarked to a friend who has long been a leader among special librarians, that on recent visits to England and Brazil I had been repeatedly asked why librarians in the United States were so belligerently opposed to classification. My friend's reply was immediate, explosive, and, I am afraid, very typical of most of us— "That's easy, because it's no good!" The substance of this essay, then is as much a protest against such a misunderstanding of the role of classification in librarianship, as it is a forecast of the future Like the Apostles' Creed, it may be regarded as, "The essence of things hoped for—the substance of things unseen."

THE NATURE OF CLASSIFICATION

Niels Bohr has reminded us that knowledge is synthesized within the human mind as a conceptual framework, a framework that—ideally at least is an unambiguous logical representation of relations between and among experiences. This framework is not static but must be adapted to provide for new experience. The limits of expandability of any such frame, then, are always finite and eventually they prove too confining to comprehend new experience and abandonment becomes

unavoidable. Such revolutions in thinking may be born of the most intensive specialization, yet they dictate a reorientation of the unity of all knowledge.[1]   Thus the physicists at the close of the nineteenth century assumed that their task was essentially finished and resigned themselves to refining measurement and to computing the constants in nature with greater accuracy. But the discoveries of recent decades shattered forever their comfortable little world - a world which will not be tolerated again.[2]   Because the evolution of man's knowledge is not a predictable and finite process, because a field of endeavor may never properly be regarded as closed, and hence because classification can never be seriously advanced with a pretense of ultimacy, we have come at times to question whether anything useful can be gained by attempts at classification, especially since the Unified-Science movement tends to obliterate distinction among the disciplines. But the permanence of any one system of classification is not a valid measure of the utility of classification *per se,* and it has nothing whatever to do with classification as a mode of human thought.

Far more relevant to the present discussion is John Dewey's contention that knowledge *is* classification, for knowledge is not just an awareness of events but of events-with-meanings. The assertion that to know is to define implies the recognition that wherever there is knowledge there is explicitly present a universal. As Dewey says,

> To hold that cognition is recognition is to concede that likeness, a relation, rather than existence, is central. And to be acquanted with anything is to be aware what it is *like,* in what *sort* of ways it is likely to behave. These features, character, kind, sort, universal, likeness, fall within the universe of meaning. Hence the theories which make them constitutive of knowledge acknowledge that *having* meanings is a prerequisite of knowing.[3]

So, also, Gordon Childe holds that knowledge is a pattern of communicable ideas symbolized in language, a structured pattern of categories which connotes classification. Such categories as *space, time, causality, substance,* etc. denote ways in which empirical data, since knowledge is assumed to derive from experience with the external world, are supposed to hang together to form a pattern, a pattern which represents for each individual some segment of the universe as he comprehends it.[4]

This insistence of both the philosopher and the anthropologist on the dependence of knowledge upon classification is not coincidental. As the present writer, following closely the work of Jerome Bruner and others, pointed out in a paper presented in 1957 at the Dorking conference on classification, the total process of cognition, of the utilization of information in thinking and problem solving, is one in which class identity is inferred from observed criterial properties or attributes exhibited by an object or event.[5]   "Thinking," then, as it is

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commonly understood, is a process of pattern creation or pattern recognition, i.e., classification, and conjunctive, relational, and disjunctive concepts are the warp and woof of the pattern, the lines of reference of the classification. These concepts may be either "certainties" or "probabilities" depending upon whether or not they coincide with past experience to the extent that they can be assigned to class membership. Cognition, then, results in pattern, and the brain is the loom by which it is woven.[6] One is reminded of Mephistopheles' explanation to the young student in Goethe's *Faust:*

> In fact, when men are fabricating thought,
> It goes as when a weaver's masterpiece is wrought.
> One treadle sets a thousand threads a-going,
> And to and fro the shuttle flies;
> Quite unperceived the threads are flowing,
> One stroke effects a thousand ties.[7]

The categories which man formulates, the terms of which he sorts out in responding to the world about him, are strongly conditioned by the culture into which he is born. Each culture formulates its own master plan, its structure of values, its own classification of knowledge, in a manner that reflects the common language, the way of life, the religious beliefs, and the accumulated experiences of the group. Thus each man's personal history images the traditions and thought patterns of his culture. The events of which his life is composed and the relations those events, experiences, and perceptions bear to each other must be filtered through the categorical system he has learned, or he departs from it at his peril. All thinking, all knowledge, begins, as Susanne Langer has stated, in the basic formulation of sense perception, for all thinking is conceptual and conception begins in the recognition of pattern, relationship, the comprehension of *Gestalt.*[8] Thus man is literally ensnared in a web of classification. Within limits he can, to paraphrase Dr. Johnson, alter the reticulations and decussations and vary the interstices between the intersections, but he can no more escape from his network of concepts than could Lemuel Gulliver break the strands by which the Lilliputians held him captive. Only the innovators, the discoverers, have the ability and the courage to sever even a limited number of these bonds, and over them hangs the constant threat of ridicule, social ostracism, and even the hemlock itself. Yet it is such as they who reshape the pattern, relocate the ties of relationship, and thus contribute to a redefinition of the cultural pattern which future generations solidify into accepted stereotypes as their predecessors had formalized the patterns of an earlier day. In such manner does the social conscience make cowards of us all and sickly o'er our native hue of resolution. Thus, to quote Susanne Langer,

> The modern mind is an incredible complex of impressions and transformations; and its product is a fabric of meanings that

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would make the most elaborate dream of the most ambitious tapestry-weaver look like a mat. The warp of that fabric consists of what we call 'data,' the *signs* to which experience has conditioned us to attend, and upon which we act often without any conscious ideation. The woof is symbolism. Out of signs and symbols we weave our tissue of 'reality.'[9]

Hellenic thought was unified by the study of first principles, for which Plato's dialectic provided the method and which Aristotle formulated as a science of metaphysics. Medieval scholarship, which was theocentric in the extreme, was logically ordered by a theology in which were set forth, with due proportion and emphasis, the truths, relating to God and man, man and man, and man and nature. The Age of Enlightenment was dominated by a search for a rational explanation of the universe and human behavior was measured against the cold clear light of reason, and from its roots, thrust deep into the earlier insistence of Bacon on the importance of the human faculties, modern principles of classification emerged.

THE NATURE OF LIBRARY CLASSIFICATION

Library classification, even before that memorable Sunday morning when, in the Amherst chapel, the decimal system burst upon Melvil Dewey like the revelation of the Apocalypse, was a transfer from, or more precisely a reflection of, man's unceasing quest for an ordered universe of structured relationships. Callimachus organized the collections of the great Alexandriana in accordance with the major categories, or disciplines, into which Greek thought was divided. The monastic libraries of the medieval world reflected, as one might assume, the theological doctrines of the Church, and relegated, according to Prideaux, the books of the heretics to "mourning and dirt."[10] Naude, in the mid-seventeenth century, was a true descendant of the Renaissance in his return to the classical example of the Alexandriana. The great system of Brunet, which according to Gustav Mouravit is both synthetic and analytic, presents in its principal divisions "the great sphere into which the activities of human thought are deployed," while at the same time offering "in their minute details, the products of those activities" and following "all the ramifications on which those activities are exercised."[11] Brunet traces the course of human thought from God, through justice, law, and man's relation to man, through his knowledge of his environment, the external world, and the manifestations of the human imagination, to the eventual contemplation of the record of the human adventure. Thus it represents something of a compromise between the theologians and the precursors of modern science, and invites comparison with and, indeed, is reminiscent of Bacon's tripartite classification of the human faculties of memory, reason, and imagination.

Brunet died too early to be influenced by Darwin, but both Dewey

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and Cutter, and especially the latter's principle of expansion, were deeply influenced by the doctrine of evolution. But it was the classification of James Duff Brown that most strongly reflected the evolutionary thesis. Brown postulated that every science or art springs from some definite source and that in its categorization some serial development may be assumed. Thus he predicated his scheme upon the assumption that in the order of things there first was *matter* and *force,* which gave rise to *life,* which, in time, produced *mind,* which eventuated in *record.* Martel and Hanson at the Library of Congress built their structure on the foundations Cutter had laid, and the same may be said with respect to Bruxelles' debt to Dewey. Though in the latter, the forefathers of the *Universal Decimal Classification* at least recognized that the content of books cannot be adequately described in terms of a single linguistic isolate. Hence they made an heroic effort to introduce into the U.D.C. an elaborate system of associative signs to represent some of the most important relationships by which human thought is patterned.

Henry E. Bliss who certainly had one of the finest minds yet to address itself to the problems of library classification, and who devised one of the two most modern schemes now available, attempted to reconcile in one hierarchical sequence a series of sub-orders, the developmental, the pedagogic, etc. The system that emerged he believed to be in harmony with "the order of nature" and the contemporary "scientific consensus," and hence, in his opinion, relatively permanent. In this Bliss was not unlike the nineteenth-century physicists who saw nothing in their futures but improvement in the refining of measurement and the computing of constants.

Ranganathan is probably the only man who can challenge Bliss on his own terms—and he has done so. Whatever one may think of the *Colon Classification* certainly its distinguished creator has surpassed all others in his grasp of the fundamental problems of organizing the intellectual content of graphic records. In his facet analysis and its American counterpart, semantic factoring, the role of classification in bibliographic organization achieves a new and greater significance than it ever had as applied to book arrangement or even as exemplified in the classified catalogue. But despite the work of Ranganathan and Bliss, and their intellectual kin, library classification as it is thought of today was born of the eighteenth-century enlightenment and matured in nineteenth-century Darwinism, with but superficial embellishments that, in the main, are but the tinsel of twentieth-century epistemology. To say of library classification that it is utilitarian is not, in itself, derogatory, it should be useful, but today library classification is utilitarian at the lowest level of its capabilities. It does not structure recorded knowledge in patterns harmonious with the patterns of thought of the library user, it serves mainly as a device by which one may find a particular book. The Dewey *Decimal Classification,* in whatever edition, and the shelf of drab paper bound volumes that are the classification of the Library of Congress, are not a gate through

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which the mind is led into the recorded world of the human adventure, they are only an address-book for the library stacks.

THE REJECTION OF BIBLIOGRAPHIC CLASSIFICATION

The librarian's traditional distrust of the importance of classification may be directly attributed to his indifference to the theory of librarianship. From the days of Dewey, the librarian has viewed classification as little more than an array of pigeon-holes into which books might be conveniently slipped, according to the subject of which they treat, and from which they may be retrieved when that subject is in demand. But as the world of knowledge expanded these compartmentalized arrays became increasingly complex and the problem of assignment of titles to them involved decisions that were correspondingly involved, until the whole idea was abandoned as excessively intricate for all purposes except the simple task of physical location. By contrast the alphabetical subject catalogue seemed a more practicable alternative. But librarians forgot that the alphabetical subject catalogue itself, as Phyllis Richmond has demonstrated,[12] must, if it is to achieve its fullest utility, be derived from a classified structuring of the fields it encompasses. To be sure the subject catalogue was often rationalized as a supplement to the classification, but in many areas of library material, particularly in those involving history and geography, its terms merely recapitulated the sequence of the classification scheme.

The assumption that a subject index can compensate for the inadequacies of a classification scheme Bliss has properly characterized as the subject index illusion which, one should add, arises from a serious over-simplification of the bibliographic problem. Books are not, as Dewey and his contemporaries apparently saw them, taxonomic specimens that can be arranged in a hierarchy of genus, species, and sub-species according to the presence or absence of a single characteristic or physical property or group of covariant characteristics or properties, that differentiate the members of one group from those in another. Library classification has been defined by many people, but the definition devised by William Randall, and modified slightly by the present writer, is typical and probably as satisfactory as any for present purposes. According to this definition a library classification is:

A list of terms which are specifically different from each other, used to describe the subject content of graphic records, inclusive of all knowledge defined by the limits of the scheme, infinitely hospitable with regard to significant differences among the concepts, with an arrangement that is linear, unique, and meaningful to the user, and which, when applied to graphic records, results in the arrangement of the records themselves.

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This is pure bibliographic taxonomy, and its fallacy lies buried in the phrase "terms that describe the subject content of books," for terms do not define the subject content of books as they define a biological specimen by categorizing its physical properties. Any attempt to substitute for classification a system which mechanically coordinates or otherwise manipulates controlled or uncontrolled verbal isolates, such as uniterms, Zator descriptors, and the like, results, as Vickery has shown, in increased confusion.[13]

The librarian and the bibliographic instruments with which he works together constitute a bridge between the user of graphic records and the records themselves. Therefore, recourse to graphic records, or retrieval, must be the focal point of a library theory and the end toward which all our efforts are directed. But retrieval is *not* a simple process of choosing graphic materials from an array of pigeon-holes, whether those pigeon-holes be a sequence of books on a shelf, documents in a file, or the representation of bibliographic units in a catalogue or bibliography. A book, even a simple book, presents a highly complex pattern of intricately related concepts which are approached by a user in whose mind there is also a complex pattern of motive, accumulated experience, and predisposition. The book, or graphic record, does not present, as is commonly assumed, a fixed conceptual pattern, or perhaps more precisely, a finite number of interrelated conceptualizations. To be sure the text does not change, but the interpretation of that text is infinitely variable. A book is the physical embodiment of what the author thought he said, but only in a limited way can it speak for itself. What it actually says is what the mind of the user chooses to put there. It was Ludwig Lewisohn, I believe, who said that "the seat of beauty is, after all, in the beholding mind," and so is the content of a book. Any act of communication can reveal an inexhaustible source of truth or mere sophistry. The distinction between the two must, as Polanyi has shown, derive from, the *text* of the message itself, the *conception* suggested by it, and the experience on which it may bear.[14] Judgment operates by trying to adjust these three patterns to each other. The outcome cannot be predicted from previous acts of communication for there may be involved the decision to correct or otherwise modify previous behavior or reinterpret experience in terms of some novel conception suggested by the text, or the result may be a decision to accept previous usage or behavior, or the text may be completely dismissed as altogether meaningless. The relationship between book and reader, then, achieves fruition only to the degree that the pattern of the book's content approaches coincidence with the thought pattern of the reader. Even in simple situations this is a complex relationship and the librarian's eternal hope to attain such a relationship with simple measures can end only in dissatisfaction. At this moment of fusion between the pattern of the graphic record and the pattern of recourse to it lies the clue to all our problems and the end of all our strivings. Here is a problem as complex as the nature of matter itself—and as worthy of serious research.

The true role of the librarian, then, is to mediate between book and reader and the human factor that is the librarian can never be eliminated. A good classification system, however carefully designed, can never substitute for a librarian with brains. Properly employed, however, classification can extend the capabilities of the librarian but it can never solve all his problems for him, in the way that Dewey seems to have anticipated, in this psycho-bibliographic relationship that characterizes the act of reading.

The librarian's rejection of classification arose from the fact that he misapplied it because he misunderstood its nature and the nature of the bibliographic process. This misapplication crystalized at a very early stage of modern library development, and, until recent years, has remained essentially unchanged. Such misapprehensions of librarians about classification were intensified by the deceptive simplicity of the alphabetical subject catalog, a form of delusion that encouraged librarians to ignore the complaints of many scholars that the dictionary catalog was almost useless as a guide to the materials of research.

There were other factors that contributed to the librarian's attitude toward classification. The enormous costs of reclassification, costs which grew geometrically as collections increased, seemed to justify the assumption that such wholesale revision was not worth the expense, this in turn led to the conclusion that one classification system was little better than another, and that none was very good. Failure of attempts to devise a universal classification scheme that would be all things to all men in all situations seemed, in the minds of many, proof of the failure of classification itself. Finally, in a country so intensively mono-lingual as the United States the pressure for a system that would bridge the conventionalities of language and deal directly with a generalized symbolization of concepts was at a minimum. Had the French influence been stronger in New England, the Dutch in New York, the German in the Middle West, and the Spanish on the West Coast the classified catalog might today have been less of a curiosity than it now is, even in our large metropolitan public libraries. As it is, the standardized subject headings of the Library of Congress have dealt effectively with such minor linguistic variables as *bag, sack, poke,* or *skillet, frying-pan, spider.*

THE RENAISSANCE OF CLASSIFICATION

Recently there have appeared manifestations of a renascence of a interest in classification. The composite and multi-faceted character of recorded knowledge, its interdependence and relatedness, the magnitude of its proliferation, or especially during the past half-century, the variety of aspects from which it may be sought, and the gravity of the social, economic, and political problems for the solution of which it is essential, all have combined to create a situation with which traditional library procedures and processes are ill-fitted to deal effectively. Growing improvement in the understanding of

the operation of the human brain and the processes of thought have focussed attention on the role of classification in cognition. A rejection of the taxonomic basis of classification for what Alfred North Whitehead has called referential classification, and the development of a wide variety of special classifications have revived interest in the possibilities that classification can offer in improving the analysis and retrieval of information. Rapidly growing interest in the development of electronic computer-like devices for expediting bibliographic search has compelled a re-examination of classification as the basis for the construction of a machine language or languages, and this in turn has necessitated a serious study of the logical bases for systems for the organization of recorded knowledge.

Some indication of this revival may be shown by a tabulation of the entries under the heading "Classification" in *Library Literature* from 1946 to 1957.

Entries in *Library Literature* Under the Heading *Classification*

U. S. and Foreign, 1946 - 1957, and 1937

Year	United States	Foreign	Total
1957	26	45	71
1956	49	46	95
1955	35	45	80
1954	21	40	61
1953	36	42	78
1952	19	37	56
1951	20	48	68
1950	6	38	44
1949	11	24	35
1948	9	16	25
1947	9	38	47
1946	5	20	25
1937	18	43	61

These crude statistics suggest that interest in classification in Europe has remained remarkably constant, that, with one exception, it has exceeded that in the United States for every year since 1946, and that, if the number of articles analyzed in *Library Literature* can be taken as an index, interest in classification on this side of the Altantic has been definitely on the increase. For a number of technical reasons which cannot be dealt with here,[15] these statistics must be interpreted with the utmost caution, but, when considered in conjunction with other forms of evidence they may represent a trend toward an increasing concern with problems in classification.

This rebirth of interest in classification is receiving increased support from without the library profession. By this I do not mean the documentalists and information specialists, whom I regard as librarians. Mathematicians, logicians, engineers, physicists, anthropologists, psychologists, linguists, and brain specialists all are becoming aware of the organization of information as a field for research and many within these professions have begun exploratory work in it. Such activities will compel librarians to reappraise classification as well as the effectiveness of their other procedures, for if they do not they will lose control of the very profession they practice.

Across the Atlantic there are forces that strengthen interest in classification here. Western Europe has long been a focus of activity in advancing bibliographic classification, and to this end much of the effort of the Federation International de Documentation has been directed. Admittedly it has suffered from illusions of universality and, at times, an over-zealous leadership, but these seem to be occupational hazards where problems of classification are concerned, and much important work has come from such centers at The Hague, Brussels, and Paris. In England the Classification Research Group, which can certainly trace its origins to the pioneering work of Ranganathan, has, in a surprisingly brief time, made rather remarkable progress in reviving research in classification.

Encouraged by the success of the British venture, Mrs. Phyllis A. Richmond, of the University of Rochester Library, began, not much more than a year ago, the promotion of a comparable group in the United States. At the present time this little band of kinspirits, which, as an affiliate of the American Documentation Institute, now numbers almost one hundred, has held three meetings in conjunction with the annual conventions of the American Library Association, the Special Libraries Association, and the American Documentation Institute. Though it is still engaged in the task of identifying targets for research, and despite the fact that it has not as yet developed a real program of activities, it is symptomatic of the growing revival of interest in classification. The promise of this activity is most gratifying to those few of us who, under the leadership of Norman T. Ball, were trying in 1947 and 1948 to direct the attention of the newly-formed A.D.I. toward a more intensive attack upon the problems of classification[16]

Perhaps the most satisfying development of all has been the growth in the use of the collection of special classifications maintained by the Special Libraries Association in cooperation with, and serviced by, the School of Library Science at Western Reserve University. This collection now numbers some 600 titles and inquiries to and loans from it are received and transmitted daily. The use that is made of this material and the continuing generosity of many people in presenting to the collection such schemes as they have developed, are convincing testimony that the librarian's concern with classification is very far from atrophying.

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THE FUTURE OF CLASSIFICATION

The initial question to which this essay was addressed can no longer be postponed. What is the future of library classification?

Certainly library classification, interpreted narrowly as a system f for preserving order in library stacks is in no danger of extinction. Stack order there must always be, or the resulting chaos would force librarians into what Verner Clapp has graphically called "simian search." Moreover, there seems little possibility that either the Dewey decimal system or that of the Library of Congress will lose, in the foreseeable future, their positions of preeminence as systems for stack arrangement. The advantage of an early start, combined with the geometric increase in the costs of reclassification as the size of the book stock grows, diminishes significantly the relative value of reclassification. Few, if any, libraries have had the courage to follow the pattern of the John Crerar in reverting to fixed location, and even this step is impracticable except in closed stack situations. The D.C. may be "a 'ell of a 'ole," but we seem unable to discover any other that is sufficiently superior to justify the risks of migration.

So far as the public library is concerned one may properly assume, in view of the almost complete uselessness of both the D.C. and L.C. to the general public, that special arrangements, in broad reader-interest categories, for open shelf collections will be on the increase. Though the librarian may not yet reject the *Decimal Classification* for his own professional needs, the day of his missionary zeal for Saint Melvil and all his works is, happily, at an end.

The continuing growth of special libraries, especially for the administrative and research needs of business, industry, and government, will promote increasing attention to the development of special systems for the retrieval of precise information from a wide variety of graphic records. Furthermore, it may also encourage increased attention to the theory of classification itself.

But the area from which the most significant developments in classification may be anticipated is that in which attention is being given to the development of new systems for mechanizing many of the routines for the more effective utilization of recorded knowledge. New information needs have posed new problems in organizing graphic records, these problems have dictated new research into the nature of information itself and the character of its use. Such research has led to the development of new systems which have promoted the invention of new machines, the limitations of which have intensified the formulation of system theory. This analytical-synthetic cycle of theory and technology must be maintained in reasonable balance, or serious mal-adjustments will ensue. If the technology advances at too great a distance beyond theory, the machine becomes the end rather than the means and dictates in ways that it should not be permitted to do the perimeters of the problem. On the other hand, theory cannot

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advance beyond the point at which the technology can support it, for eventually technology places a ceiling upon theory through which the latter cannot break because it lacks the equipment with which to work. The theory of organizing knowledge and the patterns of its use, in other words the theory of classification, lies at the very foundation of this balance, for classification as a discipline is itself a convergence of theory and technology. Its theory is rooted in logic, linguistics, and the philosophy of science, enriched and supported by psychology, mathematics, and neurology, especially the study of the human brain. Its technology finds expression in such new fields as cybernetics, the mechanization of information search, and machine translation. It is no longer the exclusive possession of the librarian, but it is his responsibility to forge a new theory of classification and a new technology for its manipulation from all the disciplines that can contribute to classification as the means by which the reader and the text he needs are brought into fruitful relationship.

One of the characters in a recent science-fiction novel by Robert Heinlein says, "Dad claims that library science is the foundation of all sciences—just as math is the key—and that we will survive or flounder depending on how well the librarians do their job." If it be true that librarianship is the foundation of all science, and I like to think that it is, then certainly classification, the science of order by which man structures the universe in which he finds himself and by which his own behavior is patterned, is the mortar with which the blocks of that foundation are held in unity.

Notes

1. Niels Bohr, *Atomic Physics and Human Knowledge* (New York: Wiley, 1958) pp. 67ff.

2. See Henry Margenau, *The Nature of Physical Reality* (New York: McGraw Hill, 1950) pp. 18-20.

3. John Dewey, *Experience and Nature* (Chicago: Open Court, 1925) p. 330.

4. V. Gordon Childe, *Society and Knowledge* (New York: Harpers, 1956) pp. 65-73.

5. Jesse H. Shera, "Pattern Structure, and Conceptualization in Classification," *Proceedings of the International Study Conference on Classification for Information Retrieval,* 13-17 May 1957   (New York: Pergamon Press, 1957) pp. 19-21.
Jerome S. Bruner, Jacquile J. Goodnow, and George A. Austin, *A Study of Thinking* (New York: Wiley, 1956) pp. 243-245.

6. W. Grey Walter, *The Living Brain* (New York: Norton, 1953) p. 72.

7. Mephistopheles to the Young Student. From George R. Priest's translation of Goethe's *Faust*.

8. Susanne K. Langer, *Philosophy in a New Key* (Cambridge: Harvard University Press,* 1948) p. 218.

9. *Ibid.* p. 227.

10. See W.R.B. Prideaux, "Library Economy (Chiefly Continental) at the End of the Seventeenth Century," *Library Association Record,* VI (March 15, 1904), 133.

11. Gustave Mouravit, *Le Livre et la Petite Bibliothéque d'Amateur* . . . (Paris: Aubry, n.d.)

12. Phyllis A. Richmond, "Cats: An Example of Concealed Classification in Subject Headings," *Library Resources and Technical Services,* III (Spring, 1959), 102-112.

13. B.C. Vickery, "The Need for Classification," *Classification and Indexing in Science* (London: Butterworth, 1958).

14. Michael Polanyi, *Personal Knowledge* (Chicago: University of Chicago Press, 1959) p. 95.

15. The author has made every reasonable effort to eliminate duplicate entries though admittedly some may have escaped attention. The data are also doubtless distorted by changes over the years in the periodicals indexed by *Library Literature* especially in its coverage of foreign literature. Figures are also skewed by the publication of a new edition of *D.C.* or a revised section of *L.C.* Finally, frequence of publication is not necessarily synonymous with reader interest.

16. See Norman T. Ball, "Committee on Organization of Information" *American Documentation,* I (January, 1950), 24-34.

Summary

Donald E. Strout
Professor of Library Science
University of Illinois

What we attempt here is in no sense a formal summary of content.
We seek rather, in the tradition of the previous Allerton Park Insti-
tutes, to catch and record, through a series of informal observations
and impressions, the sense and feel of the Institute as it developed at
the hands of the hundred or more participants who, for three days,
paused to reflect upon the role of classification in the present-day li-
brary and to exchange with one another their thoughts on this topic of
mutual and (for the moment, at least) intensive concern.

From the inception of planning for this Institute, it was obvious
that it would be a study in contrasts, both within itself and in compar-
ison with the earlier Institutes. The very wide net which we spread
with our first announcement made such contrasts all but inevitable.
In that opening announcement, you will recall, the invitation to attend
was extended to all librarians who had an interest in classification—
whether classifiers, administrators, or staff members from other de-
partments, whether college, university, public, or school librarians,
whether working in a very large or a very small library. This, then,
was our first contrast (in comparison with earlier Institutes)—a very
wide spread in sizes of libraries and types of library work represent-
ed. A junior high school librarian sat next to several librarians from
the Library of Congress; ranged about them were small town and city
public librarians, college and university librarians, other school li-
brarians, and even a special librarian or two. This factor, in turn,
produced a second (and related) contrast with earlier Institutes— a
decrease in the amount of public, or audience, discussion and parti-
cipation—a decrease which we may hope was compensated for in some
degree by an increase in the more private corridor conferences, table
talk, and coffee chats.

As for what was said, thought, expressed at the Institute, here again
one must record the feeling of a study in contrasts. There is no need
to recapitulate here in vertical summary the contents of the papers,
ranging in time from Aristotle to Shera and Taube and in topic from
the theory to the practice of classification, with side glances and di-
gressions in time and topic along the way. Here it may be more ap-
propriate to look horizontally at the papers, to mark the contrasts, to
hint at the recurrent themes, to give a quote or two from papers and
discussion, and to add a word or two about the rather considerable

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number of problems whose ghosts were raised, rather than laid, during the past three days.

Our first series of contrasts was born of the persons themselves who are involved in classification, either directly or indirectly. On the library side of the picture, there was the skepticism of the administrator over the costs and values of classification arrayed against the enthusiasm of the professional classifier who saw classification as the necessary, inescapable, and invaluable adjunct of the library operation. On the user side of the picture, the adequacies of classification for the non-specialist were contrasted with the adequacies (and shortcomings) of classification for the specialist. As if this weren't enough, librarian and user were met in contrast, when a sharp dichotomy emerged between what was termed the vertical approach of the librarian versus the horizontal approach of the subject specialist to the whole matter of classification. Even in the matter of word-usage that contrast between librarian and subject specialist came to light; you will recall that when our mathematician looked at what librarians call "series," he saw them more properly as "sequences" ! And for librarian and user alike, it was averred that the need and nature of classification in a closed shelf system could differ considerably from that in an open shelf system, especially as related to the use of a classed catalogue, a dictionary catalogue or a reader interest arrangement.

The theory of classification, too, as presented and discussed in this Institute, presented a series of contrasts. We heard of Gessner's "necessary" versus "embellishing" courses; we heard of Bacon's "divine" versus "human" knowledge. The schemes themselves were a series (or should it be a sequence?) of contrasts; there were the "practical" versus the "philosophical" schemes, variously expressed as the "practical" versus the "logical," or the "practical" versus the "systematic"; there were (in the applied sense) the "special" or "relative" or "special purpose" schemes versus the "universal" schemes. This matter of breadth versus specificity, or simplicity versus complexity, of schemes attracted a good deal of attention, especcially in relation to costs (the administrator speaking), up-to-dateness versus obsolescence (the subject specialist speaking), size and type of library wherein they were used, purposes of use, and backgrounds (and indeed happiness!) of users.

When our speakers and our registrants looked at the purpose and role of classification and its effects, several further contrasts were thrown sharply into focus. Is classification in the modern library a subject approach—or is it simply a shelving device? Is it a "systematizing of knowledge" or is it a "promotion of reading"? Does it, after all, succeed only in "bringing together unrelated materials" and "tearing asunder related materials"?

And, before we leave this matter of contrasts, we should note a few oddments wherein the element of contrast was evident. One speaker noted the penchant of librarians—and most people, for that matter—to regard the present pinnacle of *now* as "civilized" in contrast to all

that has gone before as "primitive." Recurrently noted was the "sophistication" versus the "simplicity" of machine approaches to knowledge, along with the relative slowness versus speed which is inherent in each. And lastly there was of course the matter of John versus Melvil Dui!

It is perhaps an inevitable consequence that, in the course of a protracted examination of a specific topic such as the one before us for the last three days, many topics are hinted at, or suggested, without being fully developed. Let us attend to these for a moment. Perhaps the most persistently recurring suggestion, in one form or another, was that any classification scheme, whether broad or close, has what one might call built-in weaknesses. More than once it was hinted that, under present-day conditions, a single, universal, comprehensive, non-overlapping classification scheme, whether broad or close, to cover a universe of content and a universe of user, is no longer realizable. Along with this (and as a result of it) the emergence of a multiplicity of special classification schemes for special purposes, along with the development of sections of existing schemes for special purposes, was noted. More than once, too, it was hinted that detailed, elaborate, close classification was costly and confusing, inadequate for any user, and likely to be short-lived. Keep the classification broad, someone suggested, and let the catalogue, via its multiple subject headings, do the job of close classification. Another put it this way: The larger the class, the longer its life; the more specific the class, the more limited its use and users and the shorter its life. Whether broad or close, in another's words, classification schemes are currently inadequate to reveal "pockets of knowledge" to those users who want all material on a subject, from the major group straight down through the minor subgroups; their net effect is to splinter, rather than to solidify, the library's holdings on a subject; the user is equally dissatisfied, or at least unsatisfied, whether he approaches the subject from a general number (which rules out the splintered subjects) or from a splintered number (which rules out other splinters and the general number as well).

There were other suggestions, too: that a classification scheme in the very large library tends to be (perhaps unavoidably) uneven, with some badly overcrowded numbers hard by others that are unfilled; that, for the closed shelf collection whose key is the classed catalog, a shelf notation would be quite adequate; that a library does not *make* classes, it *discovers* and *identifies* them; and, finally, that classification schemes should be much more truly the joint product of librarian and subject specialist.

Any gathering of a hundred or more librarians is likely to produce a fair share of assorted definitions, quotes, quotes within quotes, and general miscellany. In this, we were no exception. In fact, at times we all but went out of our way to prove the old Latin adage: *Tot homines, quot sententiae*—as many folks as you have in a room, so many the opinions you can expect. First off, everybody had something to say

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about classification, of course. One faculty member was quoted to this effect: "Classification exists to locate a book quickly and with as little fuss as possible." One of our speakers observed seamily: "The reader doesn't mind classification if it doesn't get in his way." The same speaker voiced the futility of the classification enterprise in these words: "Classification, like the value of the mathematical π is never perfect, no matter how far extended." Another speaker reminded us of a foreign librarian's description of one of the leading classification schemes of our day: "A primitive gap notation of integers." Yet another pronounced a malediction on present-day classification: "Classification in the 20th century is utilitarianism at its lowest level; L.C. and D. C. are an address book for the library staff." The subject specialist had some harsh words about the process of assigning a classification number to a series as a whole: "This is a library gimmick . . .an evasion of proper classification and merely a classification by color and binding of book." We heard Dewey alluded to as "not something we must endure, but something which has enduring qualities"; we heard also the words of the weary faculty member, "Well, Dewey may be enduring, but he certainly needs pruning and streamlining." We even heard a touch of poetry in the words of a visiting Indian librarian, describing the reader interest grouping of the Detroit Public Library: "The arrangement itself communes with life." But we were jarred back to reality with the following definition of a book: "A book is the physical embodiment of what the author thought he said."

I referred earlier to the ghosts we raised. Let me return to them for a moment as we recall some of the unresolved problems we carry with us from this Institute. What is the true value of classification: is it greater for the specialist or the non-specialist; is it, in fact, great at all for the user; or is it a kind of outmoded toy of the librarian, to take its place beside other "library gimmicks"? Is a broad or a close classification to be preferred, or are there sets of circumstances in the face of which one is at times preferable over the other? Is there a point at which, in the length of notation symbols, the law of diminishing returns sets in? Is an "unbearably long" notation a revelation as to the degree of obsolescence of the scheme? Does simplicity in notation really mean ease in handling, flexibility, adaptability; is it less expensive; is it preferable because more easily understood and more useful and satisfying to the specialist? Is a classification scheme in the present-day library a help or a hindrance to library use? What will by the place of classifcation in the library of tomorrow? When will the machines take over?

This, then, was the Institute. To me, a non-classifier, but a person deeply interested in classification, it has been an exciting and interesting experience—and so, we hope, it has to everyone who came. We have prodded, poked, pricked, and perhaps at time provoked each other for these three days. We have heard, among other things, a mathematician "grumbling out loud" about a classification scheme; we have heard a Texan talking on Dewey's durability; we have heard a self-

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styled sacrificial goat blandly reassure us in the midst of his mechanistic machinations that "classification is here to stay." And, by the way, while you're worrying about Shera's machine of tomorrow, keep your eye on today—and, when the machine comes, in the now-classic words of our Tennessean, "Don't forget to punch for turnip greens!"

Papers of the Allerton Park Institutes

Number One	October 1954 *The School Library Supervisor* (Chicago: American Library Association, 1956) $1.75
Number Two	September 1955 *Developing the Library's Personnel Program* (Not yet published)
Number Three	November 1956 *The Nature and Development of the Library Collection* (Champaign, Ill.: The Illini Union Bookstore, 1957) $1.75
Number Four	September-October 1957 *The Library as an Information Center* (Champaign, Ill.: The Illini Union Bookstore, 1958) $2.00
Number Five	November 1958 *Public Library Service to the Young Adult* (To be published by The Illini Union Bookstore, Summer 1960)
Number Six	November 1959 *The Role of Classification in the Modern American Library* (Champaign, Ill.: The Illini Union Bookstore, 1960) $2.00